SEQUENCE LISTING

<110> Alitalo et al

<120> VEGF-C OR VEGF-D MATERIALS AND METHODS FOR OLIGODENDROCYTES

<130> 28967/39670A

<160> 38

<170> PatentIn version 3.0

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gcc ccg gcc ggc gct ttt cgc aac gat gaa tgt ggc gat act ata aaa       96
Ala Pro Ala Gly Ala Phe Arg Asn Asp Glu Cys Gly Asp Thr Ile Lys
            20                  25                  30

att gaa agc ccc ggg tac ctt aca tct cct ggt tat cct cat tct tat      144
Ile Glu Ser Pro Gly Tyr Leu Thr Ser Pro Gly Tyr Pro His Ser Tyr
        35                  40                  45

cac cca agt gaa aaa tgc gaa tgg ctg att cag gct ccg gac cca tac      192
His Pro Ser Glu Lys Cys Glu Trp Leu Ile Gln Ala Pro Asp Pro Tyr
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cag aga att atg atc aac ttc aac cct cac ttc gat ttg gag gac aga      240
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gac tgc aag tat gac tac gtg gaa gtc ttc gat gga gaa aat gaa aat      288
Asp Cys Lys Tyr Asp Tyr Val Glu Val Phe Asp Gly Glu Asn Glu Asn
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gga cat ttt agg gga aag ttc tgt gga aag ata gcc cct cct cct gtt      336
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            100                 105                 110

gtg tct tca ggg cca ttt ctt ttt atc aaa ttt gtc tct gac tac gaa      384
Val Ser Ser Gly Pro Phe Leu Phe Ile Lys Phe Val Ser Asp Tyr Glu
        115                 120                 125

aca cat ggt gca gga ttt tcc ata cgt tat gaa att ttc aag aga ggt      432
Thr His Gly Ala Gly Phe Ser Ile Arg Tyr Glu Ile Phe Lys Arg Gly
    130                 135                 140

cct gaa tgt tcc cag aac tac aca aca cct agt gga gtg ata aag tcc      480
Pro Glu Cys Ser Gln Asn Tyr Thr Thr Pro Ser Gly Val Ile Lys Ser
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ccc gga ttc cct gaa aaa tat ccc aac agc ctt gaa tgc act tat att      528
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Val Phe Ala Pro Lys Met Ser Glu Ile Ile Leu Glu Phe Glu Ser Phe
            180                 185                 190

gac ctg gag cct gac tca aat cct cca ggg ggg atg ttc tgt cgc tac      624
Asp Leu Glu Pro Asp Ser Asn Pro Pro Gly Gly Met Phe Cys Arg Tyr
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gac cgg cta gaa atc tgg gat gga ttc cct gat gtt ggc cct cac att      672
Asp Arg Leu Glu Ile Trp Asp Gly Phe Pro Asp Val Gly Pro His Ile
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ggc att ctc tcc atg gtt ttt tac acc gac agc gcg ata gca aaa gaa      768
Gly Ile Leu Ser Met Val Phe Tyr Thr Asp Ser Ala Ile Ala Lys Glu
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Gly Phe Ser Ala Asn Tyr Ser Val Leu Gln Ser Ser Val Ser Glu Asp
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ttc aaa tgt atg gaa gct ctg ggc atg gaa tca gga gaa att cat tct      864
Phe Lys Cys Met Glu Ala Leu Gly Met Glu Ser Gly Glu Ile His Ser
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gac cag atc aca gct tct tcc cag tat agc acc aac tgg tct gca gag      912
Asp Gln Ile Thr Ala Ser Ser Gln Tyr Ser Thr Asn Trp Ser Ala Glu
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cgc tcc cgc ctg aac tac cct gag aat ggg tgg act ccc gga gag gat      960
Arg Ser Arg Leu Asn Tyr Pro Glu Asn Gly Trp Thr Pro Gly Glu Asp
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Ser Tyr Arg Glu Trp Ile Gln Val Asp Leu Gly Leu Leu Arg Phe Val
                325                 330                 335

acg gct gtc ggg aca cag ggc gcc att tca aaa gaa acc aag aag aaa     1056
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tgg atc acc ata aaa gaa gga aac aaa cct gtt ctc ttt cag gga aac     1152
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act cga ttt gtc cga atc aag cct gca act tgg gaa act ggc ata tct     1248
Thr Arg Phe Val Arg Ile Lys Pro Ala Thr Trp Glu Thr Gly Ile Ser
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atg aga ttt gaa gta tac ggt tgc aag ata aca gat tat cct tgc tct      1296
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gga atg ttg ggt atg gtg tct gga ctt att tct gac tcc cag atc aca      1344
Gly Met Leu Gly Met Val Ser Gly Leu Ile Ser Asp Ser Gln Ile Thr
        435                 440                 445

tca tcc aac caa gga gac aga aac tgg atg cct gaa aac atc cgc ctg      1392
Ser Ser Asn Gln Gly Asp Arg Asn Trp Met Pro Glu Asn Ile Arg Leu
    450                 455                 460

gta acc agt cgc tct ggc tgg gca ctt cca ccc gca cct cat tcc tac      1440
Val Thr Ser Arg Ser Gly Trp Ala Leu Pro Pro Ala Pro His Ser Tyr
465                 470                 475                 480

atc aat gag tgg ctc caa ata gac ctg ggg gag gag aag atc gtg agg      1488
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ggc atc atc att cag ggt ggg aag cac cga gag aac aag gtg ttc atg      1536
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agg aag ttc aag atc ggg tac agc aac aac ggc tcg gac tgg aag atg      1584
Arg Lys Phe Lys Ile Gly Tyr Ser Asn Asn Gly Ser Asp Trp Lys Met
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aac tat gat aca cct gag ctg cgg act ttt cca gct ctc tcc acg cga      1680
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Phe Ile Arg Ile Tyr Pro Glu Arg Ala Thr His Gly Gly Leu Gly Leu
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aga atg gag ctg ctg ggc tgt gaa gtg gaa gcc cct aca gct gga ccg      1776
Arg Met Glu Leu Leu Gly Cys Glu Val Glu Ala Pro Thr Ala Gly Pro
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acc act ccc aac ggg aac ttg gtg gat gaa tgt gat gac gac cag gcc      1824
Thr Thr Pro Asn Gly Asn Leu Val Asp Glu Cys Asp Asp Asp Gln Ala
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aac tgc cac agt gga aca ggt gat gac ttc cag ctc aca ggt ggc acc      1872
Asn Cys His Ser Gly Thr Gly Asp Asp Phe Gln Leu Thr Gly Gly Thr
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tca gag ttt cca aca tat ggt ttt aac tgt gaa ttt ggc tgg ggc tct      1968
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cac aag acc ttc tgc cac tgg gaa cat gac aat cac gtg cag ctc aag      2016
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gat ggc aac ttc atc tat tcc caa gct gac gaa aat cag aag ggc aaa      2112
Asp Gly Asn Phe Ile Tyr Ser Gln Ala Asp Glu Asn Gln Lys Gly Lys
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gtg gct cgc ctg gtg agc cct gtg gtt tat tcc cag aac tct gcc cac      2160
Val Ala Arg Leu Val Ser Pro Val Val Tyr Ser Gln Asn Ser Ala His
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Cys Met Thr Phe Trp Tyr His Met Ser Gly Ser His Val Gly Thr Leu
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Arg Val Lys Leu Arg Tyr Gln Lys Pro Glu Glu Tyr Asp Gln Leu Val
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atc gga aaa gga aac ctt ggt ggg att gct gtg gat gac att agt att      2400
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aat aac cac att tca caa gaa gat tgt gca aaa cca gca gac ctg gat      2448
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aaa aag aac cca gaa att aaa att gat gaa aca ggg agc acg cca gga      2496
Lys Lys Asn Pro Glu Ile Lys Ile Asp Glu Thr Gly Ser Thr Pro Gly
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tac gaa ggt gaa gga gaa ggt gac aag aac atc tcc agg aag cca ggc      2544
Tyr Glu Gly Glu Gly Glu Gly Asp Lys Asn Ile Ser Arg Lys Pro Gly
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aat gtg ttg aag acc tta gaa ccc atc ctc atc acc atc ata gcc atg      2592
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Ser Ala Leu Gly Val Leu Leu Gly Ala Val Cys Gly Val Val Leu Tyr
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tgt gcc tgt tgg cat aat ggg atg tca gaa aga aac ttg tct gcc ctg      2688
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35 40 45

His Pro Ser Glu Lys Cys Glu Trp Leu Ile Gln Ala Pro Asp Pro Tyr
50 55 60

Gln Arg Ile Met Ile Asn Phe Asn Pro His Phe Asp Leu Glu Asp Arg
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Asp Cys Lys Tyr Asp Tyr Val Glu Val Phe Asp Gly Glu Asn Glu Asn
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Gly His Phe Arg Gly Lys Phe Cys Gly Lys Ile Ala Pro Pro Pro Val
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Val Ser Ser Gly Pro Phe Leu Phe Ile Lys Phe Val Ser Asp Tyr Glu
115 120 125

Thr His Gly Ala Gly Phe Ser Ile Arg Tyr Glu Ile Phe Lys Arg Gly
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Pro Glu Cys Ser Gln Asn Tyr Thr Thr Pro Ser Gly Val Ile Lys Ser
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Asp Leu Glu Pro Asp Ser Asn Pro Pro Gly Gly Met Phe Cys Arg Tyr
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210 215 220

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Gly Ile Leu Ser Met Val Phe Tyr Thr Asp Ser Ala Ile Ala Lys Glu
245 250 255

Gly Phe Ser Ala Asn Tyr Ser Val Leu Gln Ser Ser Val Ser Glu Asp
260 265 270

Phe Lys Cys Met Glu Ala Leu Gly Met Glu Ser Gly Glu Ile His Ser
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Arg Ser Arg Leu Asn Tyr Pro Glu Asn Gly Trp Thr Pro Gly Glu Asp
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Ser Tyr Arg Glu Trp Ile Gln Val Asp Leu Gly Leu Leu Arg Phe Val
325 330 335

Thr Ala Val Gly Thr Gln Gly Ala Ile Ser Lys Glu Thr Lys Lys Lys
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Phe Ile Arg Ile Tyr Pro Glu Arg Ala Thr His Gly Gly Leu Gly Leu
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Thr Thr Pro Asn Gly Asn Leu Val Asp Glu Cys Asp Asp Asp Gln Ala
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Asn Cys His Ser Gly Thr Gly Asp Asp Phe Gln Leu Thr Gly Gly Thr
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Thr Val Leu Ala Thr Glu Lys Pro Thr Val Ile Asp Ser Thr Ile Gln
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Ser Glu Phe Pro Thr Tyr Gly Phe Asn Cys Glu Phe Gly Trp Gly Ser
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His Lys Thr Phe Cys His Trp Glu His Asp Asn His Val Gln Leu Lys
            660                 665                 670

Trp Ser Val Leu Thr Ser Lys Thr Gly Pro Ile Gln Asp His Thr Gly
        675                 680                 685

Asp Gly Asn Phe Ile Tyr Ser Gln Ala Asp Glu Asn Gln Lys Gly Lys
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Val Ala Arg Leu Val Ser Pro Val Val Tyr Ser Gln Asn Ser Ala His
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Cys Met Thr Phe Trp Tyr His Met Ser Gly Ser His Val Gly Thr Leu
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Trp Met Ala Ile Gly His Gln Gly Asp His Trp Lys Glu Gly Arg Val
        755                 760                 765

Leu Leu His Lys Ser Leu Lys Leu Tyr Gln Val Ile Phe Glu Gly Glu
    770                 775                 780

Ile Gly Lys Gly Asn Leu Gly Gly Ile Ala Val Asp Asp Ile Ser Ile
785                 790                 795                 800

Asn Asn His Ile Ser Gln Glu Asp Cys Ala Lys Pro Ala Asp Leu Asp
                805                 810                 815

Lys Lys Asn Pro Glu Ile Lys Ile Asp Glu Thr Gly Ser Thr Pro Gly
            820                 825                 830

Tyr Glu Gly Glu Gly Glu Gly Asp Lys Asn Ile Ser Arg Lys Pro Gly
        835                 840                 845

Asn Val Leu Lys Thr Leu Glu Pro Ile Leu Ile Thr Ile Ile Ala Met
    850                 855                 860

Ser Ala Leu Gly Val Leu Leu Gly Ala Val Cys Gly Val Val Leu Tyr
865                 870                 875                 880

Cys Ala Cys Trp His Asn Gly Met Ser Glu Arg Asn Leu Ser Ala Leu
                885                 890                 895

Glu Asn Tyr Asn Phe Glu Leu Val Asp Gly Val Lys Leu Lys Lys Asp
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aga cac caa gtg aga ggc caa cca gac cca ccg tgc gga ggt cgt ttg      96
Arg His Gln Val Arg Gly Gln Pro Asp Pro Pro Cys Gly Gly Arg Leu
            20                  25                  30

aat tcc aaa gat gct ggc tat atc acc tct ccc ggt tac ccc cag gac     144
Asn Ser Lys Asp Ala Gly Tyr Ile Thr Ser Pro Gly Tyr Pro Gln Asp
        35                  40                  45

tac ccc tcc cac cag aac tgc gag tgg att gtt tac gcc ccc gaa ccc     192
Tyr Pro Ser His Gln Asn Cys Glu Trp Ile Val Tyr Ala Pro Glu Pro
    50                  55                  60

aac cag aag att gtc ctc aac ttc aac cct cac ttt gaa atc gag aag     240
Asn Gln Lys Ile Val Leu Asn Phe Asn Pro His Phe Glu Ile Glu Lys
65                  70                  75                  80

cac gac tgc aag tat gac ttt atc gag att cgg gat ggg gac agt gaa     288
His Asp Cys Lys Tyr Asp Phe Ile Glu Ile Arg Asp Gly Asp Ser Glu
                85                  90                  95

tcc gca gac ctc ctg ggc aaa cac tgt ggg aac atc gcc ccg ccc acc     336
Ser Ala Asp Leu Leu Gly Lys His Cys Gly Asn Ile Ala Pro Pro Thr
            100                 105                 110

atc atc tcc tcg ggc tcc atg ctc tac atc aag ttc acc tcc gac tac     384
Ile Ile Ser Ser Gly Ser Met Leu Tyr Ile Lys Phe Thr Ser Asp Tyr
        115                 120                 125

gcc cgg cag ggg gca ggc ttc tct ctg cgc tac gag atc ttc aag aca     432
Ala Arg Gln Gly Ala Gly Phe Ser Leu Arg Tyr Glu Ile Phe Lys Thr
    130                 135                 140

ggc tct gaa gat tgc tca aaa aac ttc aca agc ccc aac ggg acc atc     480
Gly Ser Glu Asp Cys Ser Lys Asn Phe Thr Ser Pro Asn Gly Thr Ile
145                 150                 155                 160

gaa tct cct ggg ttt cct gag aag tat cca cac aac ttg gac tgc acc     528
Glu Ser Pro Gly Phe Pro Glu Lys Tyr Pro His Asn Leu Asp Cys Thr
                165                 170                 175

ttt acc atc ctg gcc aaa ccc aag atg gag atc atc ctg cag ttc ctg     576
Phe Thr Ile Leu Ala Lys Pro Lys Met Glu Ile Ile Leu Gln Phe Leu
            180                 185                 190

atc ttt gac ctg gag cat gac cct ttg cag gtg gga gag ggg gac tgc     624
Ile Phe Asp Leu Glu His Asp Pro Leu Gln Val Gly Glu Gly Asp Cys
        195                 200                 205

aag tac gat tgg ctg gac atc tgg gat ggc att cca cat gtt ggc ccc     672
Lys Tyr Asp Trp Leu Asp Ile Trp Asp Gly Ile Pro His Val Gly Pro
    210                 215                 220

ctg att ggc aag tac tgt ggg acc aaa aca ccc tct gaa ctt cgt tca     720
Leu Ile Gly Lys Tyr Cys Gly Thr Lys Thr Pro Ser Glu Leu Arg Ser
225                 230                 235                 240
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tcg acg ggg atc ctc tcc ctg acc ttt cac acg gac atg gcg gtg gcc      768
Ser Thr Gly Ile Leu Ser Leu Thr Phe His Thr Asp Met Ala Val Ala
                245                 250                 255

aag gat ggc ttc tct gcg cgt tac tac ctg gtc cac caa gag cca cta      816
Lys Asp Gly Phe Ser Ala Arg Tyr Tyr Leu Val His Gln Glu Pro Leu
            260                 265                 270

gag aac ttt cag tgc aat gtt cct ctg ggc atg gag tct ggc cgg att      864
Glu Asn Phe Gln Cys Asn Val Pro Leu Gly Met Glu Ser Gly Arg Ile
        275                 280                 285

gct aat gaa cag atc agt gcc tca tct acc tac tct gat ggg agg tgg      912
Ala Asn Glu Gln Ile Ser Ala Ser Ser Thr Tyr Ser Asp Gly Arg Trp
    290                 295                 300

acc cct caa caa agc cgg ctc cat ggt gat gac aat ggc tgg acc ccc      960
Thr Pro Gln Gln Ser Arg Leu His Gly Asp Asp Asn Gly Trp Thr Pro
305                 310                 315                 320

aac ttg gat tcc aac aag gag tat ctc cag gtg gac ctg cgc ttt tta     1008
Asn Leu Asp Ser Asn Lys Glu Tyr Leu Gln Val Asp Leu Arg Phe Leu
                325                 330                 335

acc atg ctc acg gcc atc gca aca cag gga gcg att tcc agg gaa aca     1056
Thr Met Leu Thr Ala Ile Ala Thr Gln Gly Ala Ile Ser Arg Glu Thr
            340                 345                 350

cag aat ggc tac tac gtc aaa tcc tac aag ctg gaa gtc agc act aat     1104
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gga gag gac tgg atg gtg tac cgg cat ggc aaa aac cac aag gta ttt     1152
Gly Glu Asp Trp Met Val Tyr Arg His Gly Lys Asn His Lys Val Phe
    370                 375                 380

caa gcc aac aac gat gca act gag gtg gtt ctg aac aag ctc cac gct     1200
Gln Ala Asn Asn Asp Ala Thr Glu Val Val Leu Asn Lys Leu His Ala
385                 390                 395                 400

cca ctg ctg aca agg ttt gtt aga atc cgc cct cag acc tgg cac tca     1248
Pro Leu Leu Thr Arg Phe Val Arg Ile Arg Pro Gln Thr Trp His Ser
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cag atc tcc gcc tct tcc acc cag gaa tac ctc tgg agc ccc agt gca     1392
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Ala Arg Leu Val Ser Ser Arg Ser Gly Trp Phe Pro Arg Ile Pro Gln
465                 470                 475                 480

gcc cag ccc ggt gag gag tgg ctt cag gta gat ctg gga aca ccc aag     1488
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        515                 520                 525

agc cta aac ggc aag gac tgg gaa tac att cag gac ccc agg acc cag     1632
Ser Leu Asn Gly Lys Asp Trp Glu Tyr Ile Gln Asp Pro Arg Thr Gln
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            580                 585                 590

gac tgg aca gac tcc aag ccc acg gta aaa acg ctg gga ccc act gtg     1824
Asp Trp Thr Asp Ser Lys Pro Thr Val Lys Thr Leu Gly Pro Thr Val
        595                 600                 605

aag agc gaa gag aca acc acc ccc tac ccc acc gaa gag gag gcc aca     1872
Lys Ser Glu Glu Thr Thr Thr Pro Tyr Pro Thr Glu Glu Glu Ala Thr
    610                 615                 620

gag tgt ggg gag aac tgc agc ttt gag gat gac aaa gat ttg cag ctc     1920
Glu Cys Gly Glu Asn Cys Ser Phe Glu Asp Asp Lys Asp Leu Gln Leu
625                 630                 635                 640

cct tcg gga ttc aat tgc aac ttc gat ttc ctc gag gag ccc tgt ggt     1968
Pro Ser Gly Phe Asn Cys Asn Phe Asp Phe Leu Glu Glu Pro Cys Gly
                645                 650                 655

tgg atg tat gac cat gcc aag tgg ctc cgg acc acc tgg gcc agc agc     2016
Trp Met Tyr Asp His Ala Lys Trp Leu Arg Thr Thr Trp Ala Ser Ser
            660                 665                 670

tcc agc cca aac gac cgg acg ttt cca gat gac agg aat ttc ttg cgg     2064
Ser Ser Pro Asn Asp Arg Thr Phe Pro Asp Asp Arg Asn Phe Leu Arg
        675                 680                 685

ctg cag agt gac agc cag aga gag ggc cag tat gcc cgg ctc atc agc     2112
Leu Gln Ser Asp Ser Gln Arg Glu Gly Gln Tyr Ala Arg Leu Ile Ser
    690                 695                 700

ccc cct gtc cac ctg ccc cga agc ccg gtg tgc atg gag ttc cag tac     2160
Pro Pro Val His Leu Pro Arg Ser Pro Val Cys Met Glu Phe Gln Tyr
705                 710                 715                 720

cag gcc acg ggc ggc cgc ggg gtg gcg ctg cag gtg gtg cgg gaa gcc     2208
Gln Ala Thr Gly Gly Arg Gly Val Ala Leu Gln Val Val Arg Glu Ala
                725                 730                 735

agc cag gag agc aag ttg ctg tgg gtc atc cgt gag gac cag ggc ggc     2256
Ser Gln Glu Ser Lys Leu Leu Trp Val Ile Arg Glu Asp Gln Gly Gly
            740                 745                 750
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gag tgg aag cac ggg cgg atc atc ctg ccc agc tac gac atg gag tac      2304
Glu Trp Lys His Gly Arg Ile Ile Leu Pro Ser Tyr Asp Met Glu Tyr
        755                 760                 765

cag att gtg ttc gag gga gtg ata ggg aaa gga cgt tcc gga gag att      2352
Gln Ile Val Phe Glu Gly Val Ile Gly Lys Gly Arg Ser Gly Glu Ile
    770                 775                 780

gcc att gat gac att cgg ata agc act gat gtc cca ctg gag aac tgc      2400
Ala Ile Asp Asp Ile Arg Ile Ser Thr Asp Val Pro Leu Glu Asn Cys
785                 790                 795                 800

atg gaa ccc atc tcg gct ttt gca gtg gac atc cca gaa ata cat gag      2448
Met Glu Pro Ile Ser Ala Phe Ala Val Asp Ile Pro Glu Ile His Glu
                805                 810                 815

aga gaa gga tat gaa gat gaa att gat gat gaa tac gag gtg gac tgg      2496
Arg Glu Gly Tyr Glu Asp Glu Ile Asp Asp Glu Tyr Glu Val Asp Trp
            820                 825                 830

agc aat tct tct tct gca acc tca ggg tct ggc gcc ccc tcg acc gac      2544
Ser Asn Ser Ser Ser Ala Thr Ser Gly Ser Gly Ala Pro Ser Thr Asp
        835                 840                 845

aaa gaa aag agc tgg ctg tac acc ctg gat ccc atc ctc atc acc atc      2592
Lys Glu Lys Ser Trp Leu Tyr Thr Leu Asp Pro Ile Leu Ile Thr Ile
    850                 855                 860

atc gcc atg agc tca ctg ggc gtc ctc ctg ggg gcc acc tgt gca ggc      2640
Ile Ala Met Ser Ser Leu Gly Val Leu Leu Gly Ala Thr Cys Ala Gly
865                 870                 875                 880

ctc ctg ctc tac tgc acc tgt tcc tac tcg ggc ctg agc tcc cga agc      2688
Leu Leu Leu Tyr Cys Thr Cys Ser Tyr Ser Gly Leu Ser Ser Arg Ser
                885                 890                 895

tgc acc aca ctg gag aac tac aac ttc gag ctc tac gat ggc ctt aag      2736
Cys Thr Thr Leu Glu Asn Tyr Asn Phe Glu Leu Tyr Asp Gly Leu Lys
            900                 905                 910

cac aag gtc aag atg aac cac caa aag tgc tgc tcc gag gca tga          2781
His Lys Val Lys Met Asn His Gln Lys Cys Cys Ser Glu Ala
        915                 920                 925
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<212> PRT
<213> Homo sapiens

<400> 4

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Arg His Gln Val Arg Gly Gln Pro Asp Pro Pro Cys Gly Gly Arg Leu
            20                  25                  30

Asn Ser Lys Asp Ala Gly Tyr Ile Thr Ser Pro Gly Tyr Pro Gln Asp
        35                  40                  45
```

Tyr Pro Ser His Gln Asn Cys Glu Trp Ile Val Tyr Ala Pro Glu Pro
50 55 60

Asn Gln Lys Ile Val Leu Asn Phe Asn Pro His Phe Glu Ile Glu Lys
65 70 75 80

His Asp Cys Lys Tyr Asp Phe Ile Glu Ile Arg Asp Gly Asp Ser Glu
85 90 95

Ser Ala Asp Leu Leu Gly Lys His Cys Gly Asn Ile Ala Pro Pro Thr
100 105 110

Ile Ile Ser Ser Gly Ser Met Leu Tyr Ile Lys Phe Thr Ser Asp Tyr
115 120 125

Ala Arg Gln Gly Ala Gly Phe Ser Leu Arg Tyr Glu Ile Phe Lys Thr
130 135 140

Gly Ser Glu Asp Cys Ser Lys Asn Phe Thr Ser Pro Asn Gly Thr Ile
145 150 155 160

Glu Ser Pro Gly Phe Pro Glu Lys Tyr Pro His Asn Leu Asp Cys Thr
165 170 175

Phe Thr Ile Leu Ala Lys Pro Lys Met Glu Ile Ile Leu Gln Phe Leu
180 185 190

Ile Phe Asp Leu Glu His Asp Pro Leu Gln Val Gly Glu Gly Asp Cys
195 200 205

Lys Tyr Asp Trp Leu Asp Ile Trp Asp Gly Ile Pro His Val Gly Pro
210 215 220

Leu Ile Gly Lys Tyr Cys Gly Thr Lys Thr Pro Ser Glu Leu Arg Ser
225 230 235 240

Ser Thr Gly Ile Leu Ser Leu Thr Phe His Thr Asp Met Ala Val Ala
245 250 255

Lys Asp Gly Phe Ser Ala Arg Tyr Tyr Leu Val His Gln Glu Pro Leu
260 265 270

Glu Asn Phe Gln Cys Asn Val Pro Leu Gly Met Glu Ser Gly Arg Ile
275 280 285

Ala Asn Glu Gln Ile Ser Ala Ser Ser Thr Tyr Ser Asp Gly Arg Trp
290 295 300

Thr Pro Gln Gln Ser Arg Leu His Gly Asp Asp Asn Gly Trp Thr Pro
305 310 315 320

Asn Leu Asp Ser Asn Lys Glu Tyr Leu Gln Val Asp Leu Arg Phe Leu
325 330 335

Thr Met Leu Thr Ala Ile Ala Thr Gln Gly Ala Ile Ser Arg Glu Thr
340 345 350

Gln Asn Gly Tyr Tyr Val Lys Ser Tyr Lys Leu Glu Val Ser Thr Asn
355 360 365

Gly Glu Asp Trp Met Val Tyr Arg His Gly Lys Asn His Lys Val Phe
370 375 380

Gln Ala Asn Asn Asp Ala Thr Glu Val Val Leu Asn Lys Leu His Ala
385 390 395 400

Pro Leu Leu Thr Arg Phe Val Arg Ile Arg Pro Gln Thr Trp His Ser
405 410 415

Gly Ile Ala Leu Arg Leu Glu Leu Phe Gly Cys Arg Val Thr Asp Ala
420 425 430

Pro Cys Ser Asn Met Leu Gly Met Leu Ser Gly Leu Ile Ala Asp Ser
435 440 445

Gln Ile Ser Ala Ser Ser Thr Gln Glu Tyr Leu Trp Ser Pro Ser Ala
450 455 460

Ala Arg Leu Val Ser Ser Arg Ser Gly Trp Phe Pro Arg Ile Pro Gln
465 470 475 480

Ala Gln Pro Gly Glu Glu Trp Leu Gln Val Asp Leu Gly Thr Pro Lys
485 490 495

Thr Val Lys Gly Val Ile Ile Gln Gly Ala Arg Gly Gly Asp Ser Ile
500 505 510

Thr Ala Val Glu Ala Arg Ala Phe Val Arg Lys Phe Lys Val Ser Tyr
515 520 525

Ser Leu Asn Gly Lys Asp Trp Glu Tyr Ile Gln Asp Pro Arg Thr Gln
530 535 540

Gln Pro Lys Leu Phe Glu Gly Asn Met His Tyr Asp Thr Pro Asp Ile
545 550 555 560

Arg Arg Phe Asp Pro Ile Pro Ala Gln Tyr Val Arg Val Tyr Pro Glu
565 570 575

Arg Trp Ser Pro Ala Gly Ile Gly Met Arg Leu Glu Val Leu Gly Cys
580 585 590

Asp Trp Thr Asp Ser Lys Pro Thr Val Lys Thr Leu Gly Pro Thr Val
595 600 605

Lys Ser Glu Glu Thr Thr Thr Pro Tyr Pro Thr Glu Glu Glu Ala Thr
610 615 620

Glu Cys Gly Glu Asn Cys Ser Phe Glu Asp Asp Lys Asp Leu Gln Leu
625 630 635 640

Pro Ser Gly Phe Asn Cys Asn Phe Asp Phe Leu Glu Glu Pro Cys Gly
645 650 655

Trp Met Tyr Asp His Ala Lys Trp Leu Arg Thr Thr Trp Ala Ser Ser
660 665 670

Ser Ser Pro Asn Asp Arg Thr Phe Pro Asp Asp Arg Asn Phe Leu Arg
675 680 685

Leu Gln Ser Asp Ser Gln Arg Glu Gly Gln Tyr Ala Arg Leu Ile Ser
690 695 700

Pro Pro Val His Leu Pro Arg Ser Pro Val Cys Met Glu Phe Gln Tyr
705 710 715 720

Gln Ala Thr Gly Gly Arg Gly Val Ala Leu Gln Val Val Arg Glu Ala
725 730 735

Ser Gln Glu Ser Lys Leu Leu Trp Val Ile Arg Glu Asp Gln Gly Gly
740 745 750

Glu Trp Lys His Gly Arg Ile Ile Leu Pro Ser Tyr Asp Met Glu Tyr
755 760 765

Gln Ile Val Phe Glu Gly Val Ile Gly Lys Gly Arg Ser Gly Glu Ile
770 775 780

Ala Ile Asp Asp Ile Arg Ile Ser Thr Asp Val Pro Leu Glu Asn Cys
785 790 795 800

Met Glu Pro Ile Ser Ala Phe Ala Val Asp Ile Pro Glu Ile His Glu
805 810 815

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Arg Glu Gly Tyr Glu Asp Glu Ile Asp Asp Glu Tyr Glu Val Asp Trp
            820                 825                 830

Ser Asn Ser Ser Ser Ala Thr Ser Gly Ser Gly Ala Pro Ser Thr Asp
        835                 840                 845

Lys Glu Lys Ser Trp Leu Tyr Thr Leu Asp Pro Ile Leu Ile Thr Ile
    850                 855                 860

Ile Ala Met Ser Ser Leu Gly Val Leu Leu Gly Ala Thr Cys Ala Gly
865                 870                 875                 880

Leu Leu Leu Tyr Cys Thr Cys Ser Tyr Ser Gly Leu Ser Ser Arg Ser
                885                 890                 895

Cys Thr Thr Leu Glu Asn Tyr Asn Phe Glu Leu Tyr Asp Gly Leu Lys
            900                 905                 910

His Lys Val Lys Met Asn His Gln Lys Cys Cys Ser Glu Ala
        915                 920                 925
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<221> misc_feature
<222> (348)..(410)
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gctaaatgac aggatgcagg cgacttgaga cacaaaaaga gaagcgcttc tcgcgaattc 180

aggcattgcc tcgccgctag ccttccccgc caagacccgc tgaggatttt atggttctta 240

ggcggactta agagcgtttc ggattgttaa gattatcgtt tgctggtttt tcgtccgcgc 300

aatcgtgttc tcctgcggct gcctggggac tggcttggcg aaggagg atg gag agg 356
                                                Met Glu Arg
                                                1

ggg ctg ccg ttg ctg tgc gcc acg ctc gcc ctt gcc ctc gcc ctg gcg 404
Gly Leu Pro Leu Leu Cys Ala Thr Leu Ala Leu Ala Leu Ala Leu Ala
    5   10   15

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ggc gct ttc cgc agc gac aaa tgt ggc ggg acc ata aaa atc gaa aac      452
Gly Ala Phe Arg Ser Asp Lys Cys Gly Gly Thr Ile Lys Ile Glu Asn
20                  25                  30                  35

cca ggg tac ctc aca tct ccc ggt tac cct cat tct tac cat cca agt      500
Pro Gly Tyr Leu Thr Ser Pro Gly Tyr Pro His Ser Tyr His Pro Ser
                40                  45                  50

gag aag tgt gaa tgg cta atc caa gct ccg gaa ccc tac cag aga atc      548
Glu Lys Cys Glu Trp Leu Ile Gln Ala Pro Glu Pro Tyr Gln Arg Ile
            55                  60                  65

ata atc aac ttc aac cca cat ttc gat ttg gag gac aga gac tgc aag      596
Ile Ile Asn Phe Asn Pro His Phe Asp Leu Glu Asp Arg Asp Cys Lys
        70                  75                  80

tat gac tac gtg gaa gta att gat ggg gag aat gaa ggc ggc cgc ctg      644
Tyr Asp Tyr Val Glu Val Ile Asp Gly Glu Asn Glu Gly Gly Arg Leu
    85                  90                  95

tgg ggg aag ttc tgt ggg aag att gca cct tct cct gtg gtg tct tca      692
Trp Gly Lys Phe Cys Gly Lys Ile Ala Pro Ser Pro Val Val Ser Ser
100                 105                 110                 115

ggg ccc ttt ctc ttc atc aaa ttt gtc tct gac tat gag aca cat ggg      740
Gly Pro Phe Leu Phe Ile Lys Phe Val Ser Asp Tyr Glu Thr His Gly
                120                 125                 130

gca ggg ttt tcc atc cgc tat gaa atc ttc aag aga ggg ccc gaa tgt      788
Ala Gly Phe Ser Ile Arg Tyr Glu Ile Phe Lys Arg Gly Pro Glu Cys
            135                 140                 145

tct cag aac tat aca gca cct act gga gtg ata aag tcc cct ggg ttc      836
Ser Gln Asn Tyr Thr Ala Pro Thr Gly Val Ile Lys Ser Pro Gly Phe
        150                 155                 160

cct gaa aaa tac ccc aac tgc ttg gag tgc acc tac atc atc ttt gca      884
Pro Glu Lys Tyr Pro Asn Cys Leu Glu Cys Thr Tyr Ile Ile Phe Ala
    165                 170                 175

cca aag atg tct gag ata atc ctg gag ttt gaa agt ttt gac ctg gag      932
Pro Lys Met Ser Glu Ile Ile Leu Glu Phe Glu Ser Phe Asp Leu Glu
180                 185                 190                 195

caa gac tcg aat cct ccc gga gga atg ttc tgt cgc tat gac cgg ctg      980
Gln Asp Ser Asn Pro Pro Gly Gly Met Phe Cys Arg Tyr Asp Arg Leu
                200                 205                 210

gag atc tgg gat gga ttc cct gaa gtt ggc cct cac att ggg cgt tat     1028
Glu Ile Trp Asp Gly Phe Pro Glu Val Gly Pro His Ile Gly Arg Tyr
            215                 220                 225

tgt ggg cag aaa act cct ggc cgg atc cgc tcc tct tca ggc gtt cta     1076
Cys Gly Gln Lys Thr Pro Gly Arg Ile Arg Ser Ser Ser Gly Val Leu
        230                 235                 240

tcc atg gtc ttt tac act gac agc gca ata gca aaa gaa ggt ttc tca     1124
Ser Met Val Phe Tyr Thr Asp Ser Ala Ile Ala Lys Glu Gly Phe Ser
    245                 250                 255

gcc aac tac agt gtg cta cag agc agc atc tct gaa gat ttt aag tgt     1172
Ala Asn Tyr Ser Val Leu Gln Ser Ser Ile Ser Glu Asp Phe Lys Cys
260                 265                 270                 275
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atg gag gct ctg ggc atg gaa tct gga gag atc cat tct gat cag atc      1220
Met Glu Ala Leu Gly Met Glu Ser Gly Glu Ile His Ser Asp Gln Ile
            280                 285                 290

act gca tct tca cag tat ggt acc aac tgg tct gta gag cgc tcc cgc      1268
Thr Ala Ser Ser Gln Tyr Gly Thr Asn Trp Ser Val Glu Arg Ser Arg
        295                 300                 305

ctg aac tac cct gaa aat ggg tgg act cca gga gaa gac tcc tac aag      1316
Leu Asn Tyr Pro Glu Asn Gly Trp Thr Pro Gly Glu Asp Ser Tyr Lys
    310                 315                 320

gag tgg atc cag gtg gac ttg ggc ctc ctg cga ttc gtt act gct gta      1364
Glu Trp Ile Gln Val Asp Leu Gly Leu Leu Arg Phe Val Thr Ala Val
325                 330                 335

ggg aca cag ggt gcc att tcc aag gaa acc aag aag aaa tat tat gtc      1412
Gly Thr Gln Gly Ala Ile Ser Lys Glu Thr Lys Lys Lys Tyr Tyr Val
340                 345                 350                 355

aag act tac aga gta gac atc agc tcc aac gga gag gac tgg atc tcc      1460
Lys Thr Tyr Arg Val Asp Ile Ser Ser Asn Gly Glu Asp Trp Ile Ser
            360                 365                 370

ctg aaa gag gga aat aaa gcc att atc ttt cag gga aac acc aac ccc      1508
Leu Lys Glu Gly Asn Lys Ala Ile Ile Phe Gln Gly Asn Thr Asn Pro
        375                 380                 385

aca gat gtt gtc tta gga gtt ttc tcc aaa cca ctg ata act cga ttt      1556
Thr Asp Val Val Leu Gly Val Phe Ser Lys Pro Leu Ile Thr Arg Phe
    390                 395                 400

gtc cga atc aaa cct gta tcc tgg gaa act ggt ata tct atg aga ttt      1604
Val Arg Ile Lys Pro Val Ser Trp Glu Thr Gly Ile Ser Met Arg Phe
405                 410                 415

gaa gtt tat ggc tgc aag ata aca gat tat cct tgc tct gga atg ttg      1652
Glu Val Tyr Gly Cys Lys Ile Thr Asp Tyr Pro Cys Ser Gly Met Leu
420                 425                 430                 435

ggc atg gtg tct gga ctt att tca gac tcc cag att aca gca tcc aat      1700
Gly Met Val Ser Gly Leu Ile Ser Asp Ser Gln Ile Thr Ala Ser Asn
            440                 445                 450

caa gcc gac agg aat tgg atg cca gaa aac atc cgt ctg gtg acc agt      1748
Gln Ala Asp Arg Asn Trp Met Pro Glu Asn Ile Arg Leu Val Thr Ser
        455                 460                 465

cgt acc ggc tgg gca ctg cca ccc tca ccc cac cca tac acc aat gaa      1796
Arg Thr Gly Trp Ala Leu Pro Pro Ser Pro His Pro Tyr Thr Asn Glu
    470                 475                 480

tgg ctc caa gtg gac ctg gga gat gag aag ata gta aga ggt gtc atc      1844
Trp Leu Gln Val Asp Leu Gly Asp Glu Lys Ile Val Arg Gly Val Ile
485                 490                 495

att cag ggt ggg aag cac cga gaa aac aag gtg ttc atg agg aag ttc      1892
Ile Gln Gly Gly Lys His Arg Glu Asn Lys Val Phe Met Arg Lys Phe
500                 505                 510                 515

aag atc gcc tat agt aac aat ggc tct gac tgg aaa act atc atg gat      1940
Lys Ile Ala Tyr Ser Asn Asn Gly Ser Asp Trp Lys Thr Ile Met Asp
            520                 525                 530
```

```
gac agc aag cgc aag gct aag tcg ttc gaa ggc aac aac aac tat gac      1988
Asp Ser Lys Arg Lys Ala Lys Ser Phe Glu Gly Asn Asn Asn Tyr Asp
            535                 540                 545

aca cct gag ctt cgg acg ttt tca cct ctc tcc aca agg ttc atc agg      2036
Thr Pro Glu Leu Arg Thr Phe Ser Pro Leu Ser Thr Arg Phe Ile Arg
        550                 555                 560

atc tac cct gag aga gcc aca cac agt ggg ctt ggg ctg agg atg gag      2084
Ile Tyr Pro Glu Arg Ala Thr His Ser Gly Leu Gly Leu Arg Met Glu
    565                 570                 575

cta ctg ggc tgt gaa gtg gaa gca cct aca gct gga cca acc aca ccc      2132
Leu Leu Gly Cys Glu Val Glu Ala Pro Thr Ala Gly Pro Thr Thr Pro
580                 585                 590                 595

aat ggg aac cca gtg cat gag tgt gac gac gac cag gcc aac tgc cac      2180
Asn Gly Asn Pro Val His Glu Cys Asp Asp Asp Gln Ala Asn Cys His
                600                 605                 610

agt ggc aca ggt gat gac ttc cag ctc aca gga ggc acc act gtc ctg      2228
Ser Gly Thr Gly Asp Asp Phe Gln Leu Thr Gly Gly Thr Thr Val Leu
            615                 620                 625

gcc aca gag aag cca acc att ata gac agc acc atc caa tca gag ttc      2276
Ala Thr Glu Lys Pro Thr Ile Ile Asp Ser Thr Ile Gln Ser Glu Phe
        630                 635                 640

ccg aca tac ggt ttt aac tgc gag ttt ggc tgg ggc tct cac aag aca      2324
Pro Thr Tyr Gly Phe Asn Cys Glu Phe Gly Trp Gly Ser His Lys Thr
    645                 650                 655

ttc tgc cac tgg gag cat gac agc cat gca cag ctc agg tgg agt gtg      2372
Phe Cys His Trp Glu His Asp Ser His Ala Gln Leu Arg Trp Ser Val
660                 665                 670                 675

ctg acc agc aag aca ggg ccg att cag gac cat aca gga gat ggc aac      2420
Leu Thr Ser Lys Thr Gly Pro Ile Gln Asp His Thr Gly Asp Gly Asn
                680                 685                 690

ttc atc tat tcc caa gct gat gaa aat cag aaa ggc aaa gta gcc cgc      2468
Phe Ile Tyr Ser Gln Ala Asp Glu Asn Gln Lys Gly Lys Val Ala Arg
            695                 700                 705

ctg gtg agc cct gtg gtc tat tcc cag agc tct gcc cac tgt atg acc      2516
Leu Val Ser Pro Val Val Tyr Ser Gln Ser Ser Ala His Cys Met Thr
        710                 715                 720

ttc tgg tat cac atg tcc ggc tct cat gtg ggt aca ctg agg gtc aaa      2564
Phe Trp Tyr His Met Ser Gly Ser His Val Gly Thr Leu Arg Val Lys
    725                 730                 735

cta cgc tac cag aag cca gag gaa tat gat caa ctg gtc tgg atg gtg      2612
Leu Arg Tyr Gln Lys Pro Glu Glu Tyr Asp Gln Leu Val Trp Met Val
740                 745                 750                 755

gtt ggg cac caa gga gac cac tgg aaa gaa gga cgt gtc ttg ctg cac      2660
Val Gly His Gln Gly Asp His Trp Lys Glu Gly Arg Val Leu Leu His
                760                 765                 770

aaa tct ctg aaa cta tat cag gtt att ttt gaa ggt gaa atc gga aaa      2708
Lys Ser Leu Lys Leu Tyr Gln Val Ile Phe Glu Gly Glu Ile Gly Lys
            775                 780                 785
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gga aac ctt ggt gga att gct gtg gat gat atc agt att aac aac cat      2756
Gly Asn Leu Gly Gly Ile Ala Val Asp Asp Ile Ser Ile Asn Asn His
        790                 795                 800

att tct cag gaa gac tgt gca aaa cca aca gac cta gat aaa aag aac      2804
Ile Ser Gln Glu Asp Cys Ala Lys Pro Thr Asp Leu Asp Lys Lys Asn
    805                 810                 815

aca gaa att aaa att gat gaa aca ggg agc act cca gga tat gaa gga      2852
Thr Glu Ile Lys Ile Asp Glu Thr Gly Ser Thr Pro Gly Tyr Glu Gly
820                 825                 830                 835

gaa ggg gaa ggt gac aag aac atc tcc agg aag cca ggc aat gtg ctt      2900
Glu Gly Glu Gly Asp Lys Asn Ile Ser Arg Lys Pro Gly Asn Val Leu
                840                 845                 850

aag acc ctg gat ccc atc ctg atc acc atc ata gcc atg agt gcc ctg      2948
Lys Thr Leu Asp Pro Ile Leu Ile Thr Ile Ile Ala Met Ser Ala Leu
            855                 860                 865

gga gta ctc ctg ggt gca gtc tgt gga gtt gtg ctg tac tgt gcc tgt      2996
Gly Val Leu Leu Gly Ala Val Cys Gly Val Val Leu Tyr Cys Ala Cys
        870                 875                 880

tgg cac aat ggg atg tca gaa agg aac cta tct gcc ctg gag aac tat      3044
Trp His Asn Gly Met Ser Glu Arg Asn Leu Ser Ala Leu Glu Asn Tyr
    885                 890                 895

aac ttt gaa ctt gtg gat ggt gta aag ttg aaa aaa gat aaa ctg aac      3092
Asn Phe Glu Leu Val Asp Gly Val Lys Leu Lys Lys Asp Lys Leu Asn
900                 905                 910                 915

cca cag agt aat tac tca gag gcg tga aggcacggag ctggagggaa           3139
Pro Gln Ser Asn Tyr Ser Glu Ala
                920

caagggagga gcacggcagg agaacaggtg gaggcatggg gactctgtta ctctgctttc   3199

actgtaagct gggaagggcg gggactctgt tactccgctt tcactgtaag ctcggaaggg   3259

catccacgat gccatgccag gcttttctca ggagcttcaa tgagcgtcac ctacagacac   3319

aagcaggtga ctgcggtaac aacaggaatc atgtacaagc ctgctttctt ctcttggttt   3379

catttgggta atcagaagcc atttgagacc aagtgtgact gacttcatgg ttcatcctac   3439

tagccccctt ttttcctctc tttctcctta ccctgtggtg gattcttctc ggaaactgca   3499

aaatccaaga tgctggcact aggcgttatt cagtgggccc ttttgatgga catgtgacct   3559

gtagcccagt gcccagagca tattatcata accacatttc aggggacgcc aacgtccatc   3619

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<223> Signal Peptide

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Ala Leu Ala Gly Ala Phe Arg Ser Asp Lys Cys Gly Gly Thr Ile Lys
            20                  25                  30

Ile Glu Asn Pro Gly Tyr Leu Thr Ser Pro Gly Tyr Pro His Ser Tyr
        35                  40                  45

His Pro Ser Glu Lys Cys Glu Trp Leu Ile Gln Ala Pro Glu Pro Tyr
    50                  55                  60

Gln Arg Ile Ile Ile Asn Phe Asn Pro His Phe Asp Leu Glu Asp Arg
65                  70                  75                  80

Asp Cys Lys Tyr Asp Tyr Val Glu Val Ile Asp Gly Glu Asn Glu Gly
                85                  90                  95

Gly Arg Leu Trp Gly Lys Phe Cys Gly Lys Ile Ala Pro Ser Pro Val
            100                 105                 110

Val Ser Ser Gly Pro Phe Leu Phe Ile Lys Phe Val Ser Asp Tyr Glu
        115                 120                 125

Thr His Gly Ala Gly Phe Ser Ile Arg Tyr Glu Ile Phe Lys Arg Gly
    130                 135                 140

Pro Glu Cys Ser Gln Asn Tyr Thr Ala Pro Thr Gly Val Ile Lys Ser
145                 150                 155                 160

Pro Gly Phe Pro Glu Lys Tyr Pro Asn Cys Leu Glu Cys Thr Tyr Ile
                165                 170                 175

Ile Phe Ala Pro Lys Met Ser Glu Ile Ile Leu Glu Phe Glu Ser Phe
            180                 185                 190

Asp Leu Glu Gln Asp Ser Asn Pro Pro Gly Gly Met Phe Cys Arg Tyr
        195                 200                 205

Asp Arg Leu Glu Ile Trp Asp Gly Phe Pro Glu Val Gly Pro His Ile
    210                 215                 220

Gly Arg Tyr Cys Gly Gln Lys Thr Pro Gly Arg Ile Arg Ser Ser Ser
225                 230                 235                 240
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Gly Val Leu Ser Met Val Phe Tyr Thr Asp Ser Ala Ile Ala Lys Glu
245 250 255

Gly Phe Ser Ala Asn Tyr Ser Val Leu Gln Ser Ser Ile Ser Glu Asp
260 265 270

Phe Lys Cys Met Glu Ala Leu Gly Met Glu Ser Gly Glu Ile His Ser
275 280 285

Asp Gln Ile Thr Ala Ser Ser Gln Tyr Gly Thr Asn Trp Ser Val Glu
290 295 300

Arg Ser Arg Leu Asn Tyr Pro Glu Asn Gly Trp Thr Pro Gly Glu Asp
305 310 315 320

Ser Tyr Lys Glu Trp Ile Gln Val Asp Leu Gly Leu Leu Arg Phe Val
325 330 335

Thr Ala Val Gly Thr Gln Gly Ala Ile Ser Lys Glu Thr Lys Lys Lys
340 345 350

Tyr Tyr Val Lys Thr Tyr Arg Val Asp Ile Ser Ser Asn Gly Glu Asp
355 360 365

Trp Ile Ser Leu Lys Glu Gly Asn Lys Ala Ile Ile Phe Gln Gly Asn
370 375 380

Thr Asn Pro Thr Asp Val Val Leu Gly Val Phe Ser Lys Pro Leu Ile
385 390 395 400

Thr Arg Phe Val Arg Ile Lys Pro Val Ser Trp Glu Thr Gly Ile Ser
405 410 415

Met Arg Phe Glu Val Tyr Gly Cys Lys Ile Thr Asp Tyr Pro Cys Ser
420 425 430

Gly Met Leu Gly Met Val Ser Gly Leu Ile Ser Asp Ser Gln Ile Thr
435 440 445

Ala Ser Asn Gln Ala Asp Arg Asn Trp Met Pro Glu Asn Ile Arg Leu
450 455 460

Val Thr Ser Arg Thr Gly Trp Ala Leu Pro Pro Ser Pro His Pro Tyr
465 470 475 480

Thr Asn Glu Trp Leu Gln Val Asp Leu Gly Asp Glu Lys Ile Val Arg
485 490 495

Gly Val Ile Ile Gln Gly Gly Lys His Arg Glu Asn Lys Val Phe Met
500 505 510

Arg Lys Phe Lys Ile Ala Tyr Ser Asn Asn Gly Ser Asp Trp Lys Thr
515 520 525

Ile Met Asp Asp Ser Lys Arg Lys Ala Lys Ser Phe Glu Gly Asn Asn
530 535 540

Asn Tyr Asp Thr Pro Glu Leu Arg Thr Phe Ser Pro Leu Ser Thr Arg
545 550 555 560

Phe Ile Arg Ile Tyr Pro Glu Arg Ala Thr His Ser Gly Leu Gly Leu
565 570 575

Arg Met Glu Leu Leu Gly Cys Glu Val Glu Ala Pro Thr Ala Gly Pro
580 585 590

Thr Thr Pro Asn Gly Asn Pro Val His Glu Cys Asp Asp Asp Gln Ala
595 600 605

Asn Cys His Ser Gly Thr Gly Asp Asp Phe Gln Leu Thr Gly Gly Thr
610 615 620

Thr Val Leu Ala Thr Glu Lys Pro Thr Ile Ile Asp Ser Thr Ile Gln
625 630 635 640

Ser Glu Phe Pro Thr Tyr Gly Phe Asn Cys Glu Phe Gly Trp Gly Ser
645 650 655

His Lys Thr Phe Cys His Trp Glu His Asp Ser His Ala Gln Leu Arg
660 665 670

Trp Ser Val Leu Thr Ser Lys Thr Gly Pro Ile Gln Asp His Thr Gly
675 680 685

Asp Gly Asn Phe Ile Tyr Ser Gln Ala Asp Glu Asn Gln Lys Gly Lys
690 695 700

Val Ala Arg Leu Val Ser Pro Val Val Tyr Ser Gln Ser Ser Ala His
705 710 715 720

Cys Met Thr Phe Trp Tyr His Met Ser Gly Ser His Val Gly Thr Leu
725 730 735

Arg Val Lys Leu Arg Tyr Gln Lys Pro Glu Glu Tyr Asp Gln Leu Val
740 745 750

Trp Met Val Val Gly His Gln Gly Asp His Trp Lys Glu Gly Arg Val
755 760 765

Leu Leu His Lys Ser Leu Lys Leu Tyr Gln Val Ile Phe Glu Gly Glu
770 775 780

Ile Gly Lys Gly Asn Leu Gly Gly Ile Ala Val Asp Asp Ile Ser Ile
785 790 795 800

Asn Asn His Ile Ser Gln Glu Asp Cys Ala Lys Pro Thr Asp Leu Asp
805 810 815

Lys Lys Asn Thr Glu Ile Lys Ile Asp Glu Thr Gly Ser Thr Pro Gly
820 825 830

Tyr Glu Gly Glu Gly Glu Gly Asp Lys Asn Ile Ser Arg Lys Pro Gly
835 840 845

Asn Val Leu Lys Thr Leu Asp Pro Ile Leu Ile Thr Ile Ile Ala Met
850 855 860

Ser Ala Leu Gly Val Leu Leu Gly Ala Val Cys Gly Val Val Leu Tyr
865 870 875 880

Cys Ala Cys Trp His Asn Gly Met Ser Glu Arg Asn Leu Ser Ala Leu
885 890 895

Glu Asn Tyr Asn Phe Glu Leu Val Asp Gly Val Lys Leu Lys Lys Asp
900 905 910

Lys Leu Asn Pro Gln Ser Asn Tyr Ser Glu Ala
915 920

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tgtcagttag cgcttctgag atcacacagc tgcctagggg ccgtgtgatg cccagggcaa 180

ttcttggctt tgatttttat tattattact attattttgc gttcagcttt cgggaaaccc 240

tcgtgatgtt gtaggataaa ggaaatgaca ctttgaggaa ctggagagaa catacacgcg 300

tttgggtttg aagaggaaac cggtctccgc ttccttagct tgctccctct ttgctgattt 360

caagagctat ctcctatgag gtggagatat tccagcaaga ataaaggtga agacagactg 420

actgccagga cccaggagga aaacgttgat cgttagagac ctttgcagaa gacaccacca 480

ggaggaaaat tagagaggaa aaacacaaag acataattat aggagatccc acaaacctag 540

cccgggagag agcctctctg tcaaaa atg gat atg ttt cct ctt acc tgg gtt 593
Met Asp Met Phe Pro Leu Thr Trp Val
1 5

ttc tta gct ctg tac ttt tca gga cac gaa gtg aga agc cag caa gat 641
Phe Leu Ala Leu Tyr Phe Ser Gly His Glu Val Arg Ser Gln Gln Asp
10 15 20 25

cca ccc tgc gga ggt cgg ccg aat tcc aaa gat gct ggc tac atc act 689
Pro Pro Cys Gly Gly Arg Pro Asn Ser Lys Asp Ala Gly Tyr Ile Thr
30 35 40

tcc cca ggc tac ccc cag gac tat ccc tcc cac cag aac tgt gag tgg 737
Ser Pro Gly Tyr Pro Gln Asp Tyr Pro Ser His Gln Asn Cys Glu Trp
45 50 55

att gtc tac gcc ccc gaa ccc aac cag aag att gtt ctc aac ttc aac 785
Ile Val Tyr Ala Pro Glu Pro Asn Gln Lys Ile Val Leu Asn Phe Asn
60 65 70

cct cac ttt gaa atc gag aaa cac gac tgc aag tat gac ttc att gag 833
Pro His Phe Glu Ile Glu Lys His Asp Cys Lys Tyr Asp Phe Ile Glu
75 80 85

att cgg gat ggg gac agt gag tca gct gac ctc ctg ggc aag cac tgt 881
Ile Arg Asp Gly Asp Ser Glu Ser Ala Asp Leu Leu Gly Lys His Cys
90 95 100 105

ggg aac atc gcc ccg ccc acc atc atc tcc tca ggc tcc gtg tta tac 929
Gly Asn Ile Ala Pro Pro Thr Ile Ile Ser Ser Gly Ser Val Leu Tyr
110 115 120

atc aag ttc acc tca gac tac gcc cgg cag ggg gca ggt ttc tct cta 977
Ile Lys Phe Thr Ser Asp Tyr Ala Arg Gln Gly Ala Gly Phe Ser Leu
125 130 135

cgc tat gag atc ttc aaa aca ggc tct gaa gat tgt tcc aag aac ttt 1025
Arg Tyr Glu Ile Phe Lys Thr Gly Ser Glu Asp Cys Ser Lys Asn Phe
140 145 150

aca agc ccc aat ggg acc att gaa tct cca ggg ttt cca gag aag tat 1073
Thr Ser Pro Asn Gly Thr Ile Glu Ser Pro Gly Phe Pro Glu Lys Tyr
155 160 165

cca cac aat ctg gac tgt acc ttc acc atc ctg gcc aaa ccc agg atg 1121
Pro His Asn Leu Asp Cys Thr Phe Thr Ile Leu Ala Lys Pro Arg Met
170 175 180 185

gag atc atc cta cag ttc ctg acc ttt gac ctg gag cat gac cct cta 1169
Glu Ile Ile Leu Gln Phe Leu Thr Phe Asp Leu Glu His Asp Pro Leu
190 195 200

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caa gtg ggg gaa gga gac tgt aaa tat gac tgg ctg gac atc tgg gat     1217
Gln Val Gly Glu Gly Asp Cys Lys Tyr Asp Trp Leu Asp Ile Trp Asp
            205                 210                 215

ggc att cca cat gtt gga cct ctg att ggc aag tac tgt ggg acg aaa     1265
Gly Ile Pro His Val Gly Pro Leu Ile Gly Lys Tyr Cys Gly Thr Lys
        220                 225                 230

aca ccc tcc aaa ctc cgc tcg tcc acg ggg atc ctc tcc ttg acc ttt     1313
Thr Pro Ser Lys Leu Arg Ser Ser Thr Gly Ile Leu Ser Leu Thr Phe
    235                 240                 245

cac acg gac atg gca gtg gcc aag gat ggc ttc tcc gca cgt tac tat     1361
His Thr Asp Met Ala Val Ala Lys Asp Gly Phe Ser Ala Arg Tyr Tyr
250                 255                 260                 265

ttg atc cac cag gag cca cct gag aat ttt cag tgc aat gtc cct ttg     1409
Leu Ile His Gln Glu Pro Pro Glu Asn Phe Gln Cys Asn Val Pro Leu
                270                 275                 280

gga atg gag tct ggc cgg att gct aat gaa cag atc agt gcc tcc tcc     1457
Gly Met Glu Ser Gly Arg Ile Ala Asn Glu Gln Ile Ser Ala Ser Ser
            285                 290                 295

acc ttc tct gat ggg agg tgg act cct caa cag agc cgg ctc cat ggt     1505
Thr Phe Ser Asp Gly Arg Trp Thr Pro Gln Gln Ser Arg Leu His Gly
        300                 305                 310

gat gac aat ggc tgg aca ccc aat ttg gat tcc aac aag gag tat ctc     1553
Asp Asp Asn Gly Trp Thr Pro Asn Leu Asp Ser Asn Lys Glu Tyr Leu
    315                 320                 325

cag gtg gac ctg cgc ttc cta acc atg ctc aca gcc att gca aca cag     1601
Gln Val Asp Leu Arg Phe Leu Thr Met Leu Thr Ala Ile Ala Thr Gln
330                 335                 340                 345

gga gcc att tcc agg gaa acc cag aaa ggc tac tac gtc aaa tcg tac     1649
Gly Ala Ile Ser Arg Glu Thr Gln Lys Gly Tyr Tyr Val Lys Ser Tyr
                350                 355                 360

aag ctg gaa gtc agc aca aat ggt gaa gat tgg atg gtc tac cgg cat     1697
Lys Leu Glu Val Ser Thr Asn Gly Glu Asp Trp Met Val Tyr Arg His
            365                 370                 375

ggc aaa aac cac aag ata ttc caa gcg aac aat gat gcg acc gag gtg     1745
Gly Lys Asn His Lys Ile Phe Gln Ala Asn Asn Asp Ala Thr Glu Val
        380                 385                 390

gtg cta aac aag ctc cac atg cca ctg ctg act cgg ttc atc agg atc     1793
Val Leu Asn Lys Leu His Met Pro Leu Leu Thr Arg Phe Ile Arg Ile
    395                 400                 405

cgc ccg cag acg tgg cat ttg ggc att gcc ctt cgc ctg gag ctc ttt     1841
Arg Pro Gln Thr Trp His Leu Gly Ile Ala Leu Arg Leu Glu Leu Phe
410                 415                 420                 425

ggc tgc cgg gtc aca gat gca ccc tgc tcc aac atg ctg ggg atg ctc     1889
Gly Cys Arg Val Thr Asp Ala Pro Cys Ser Asn Met Leu Gly Met Leu
                430                 435                 440

tcg ggc ctc att gct gat acc cag atc tct gcc tcc tcc acc cga gag     1937
Ser Gly Leu Ile Ala Asp Thr Gln Ile Ser Ala Ser Ser Thr Arg Glu
            445                 450                 455
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tac ctc tgg agc ccc agt gct gcc cgc ctg gtt agt agc cgc tct ggc     1985
Tyr Leu Trp Ser Pro Ser Ala Ala Arg Leu Val Ser Ser Arg Ser Gly
        460                 465                 470

tgg ttt cct cgg aac cct caa gcc cag cca ggt gaa gaa tgg ctt cag     2033
Trp Phe Pro Arg Asn Pro Gln Ala Gln Pro Gly Glu Glu Trp Leu Gln
    475                 480                 485

gta gac ctg ggg aca ccc aag aca gtg aaa ggg gtc atc atc cag gga     2081
Val Asp Leu Gly Thr Pro Lys Thr Val Lys Gly Val Ile Ile Gln Gly
490                 495                 500                 505

gcc cga gga gga gac agc atc act gcc gtg gaa gcc agg gcg ttt gta     2129
Ala Arg Gly Gly Asp Ser Ile Thr Ala Val Glu Ala Arg Ala Phe Val
                510                 515                 520

cgc aag ttc aaa gtc tcc tac agc cta aat ggc aag gac tgg gaa tat     2177
Arg Lys Phe Lys Val Ser Tyr Ser Leu Asn Gly Lys Asp Trp Glu Tyr
            525                 530                 535

atc cag gac ccc agg act cag cag aca aag ctg ttt gaa ggg aac atg     2225
Ile Gln Asp Pro Arg Thr Gln Gln Thr Lys Leu Phe Glu Gly Asn Met
        540                 545                 550

cac tat gac acc cct gac atc cga agg ttc gat cct gtt cca gcg cag     2273
His Tyr Asp Thr Pro Asp Ile Arg Arg Phe Asp Pro Val Pro Ala Gln
    555                 560                 565

tat gtg cgg gtg tac cca gag agg tgg tcg cca gca ggc atc ggg atg     2321
Tyr Val Arg Val Tyr Pro Glu Arg Trp Ser Pro Ala Gly Ile Gly Met
570                 575                 580                 585

agg ctg gag gtg ctg ggc tgt gac tgg aca gac tca aag ccc aca gtg     2369
Arg Leu Glu Val Leu Gly Cys Asp Trp Thr Asp Ser Lys Pro Thr Val
                590                 595                 600

gag acg ctg gga ccc acc gtg aag agt gaa gag act acc acc cca tat     2417
Glu Thr Leu Gly Pro Thr Val Lys Ser Glu Glu Thr Thr Thr Pro Tyr
            605                 610                 615

ccc atg gat gag gat gcc acc gag tgt ggg gaa aac tgc agc ttt gag     2465
Pro Met Asp Glu Asp Ala Thr Glu Cys Gly Glu Asn Cys Ser Phe Glu
        620                 625                 630

gat gac aaa gat ttg caa ctt cct tca gga ttc aac tgc aac ttt gat     2513
Asp Asp Lys Asp Leu Gln Leu Pro Ser Gly Phe Asn Cys Asn Phe Asp
    635                 640                 645

ttt ccg gaa gag acc tgt ggt tgg gtg tac gac cat gcc aag tgg ctc     2561
Phe Pro Glu Glu Thr Cys Gly Trp Val Tyr Asp His Ala Lys Trp Leu
650                 655                 660                 665

cgg agc acg tgg atc agc agc gct aac ccc aat gac aga aca ttt cca     2609
Arg Ser Thr Trp Ile Ser Ser Ala Asn Pro Asn Asp Arg Thr Phe Pro
                670                 675                 680

gat gac aag aac ttc ttg aaa ctg cag agt gat ggc cga cga gag ggc     2657
Asp Asp Lys Asn Phe Leu Lys Leu Gln Ser Asp Gly Arg Arg Glu Gly
            685                 690                 695

cag tac ggg cgg ctc atc agc cca ccg gtg cac ctg ccc cga agc cct     2705
Gln Tyr Gly Arg Leu Ile Ser Pro Pro Val His Leu Pro Arg Ser Pro
        700                 705                 710
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gtg tgc atg gag ttc cag tac caa gcc atg ggc ggc cac ggg gtg gca      2753
Val Cys Met Glu Phe Gln Tyr Gln Ala Met Gly Gly His Gly Val Ala
    715                 720                 725

ctg cag gtg gtt cgg gaa gcc agc cag gaa agc aaa ctc ctt tgg gtc      2801
Leu Gln Val Val Arg Glu Ala Ser Gln Glu Ser Lys Leu Leu Trp Val
730                 735                 740                 745

atc cgt gag gac cag ggc agc gag tgg aag cac ggg cgc att atc ctg      2849
Ile Arg Glu Asp Gln Gly Ser Glu Trp Lys His Gly Arg Ile Ile Leu
                750                 755                 760

ccc agc tat gac atg gag tat cag atc gtg ttc gag gga gtg ata ggg      2897
Pro Ser Tyr Asp Met Glu Tyr Gln Ile Val Phe Glu Gly Val Ile Gly
            765                 770                 775

aag gga cga tcg gga gag att tcc ggc gat gac att cgg ata agc act      2945
Lys Gly Arg Ser Gly Glu Ile Ser Gly Asp Asp Ile Arg Ile Ser Thr
        780                 785                 790

gat gtc cca ctg gag aac tgc atg gaa ccc ata tca gct ttt gca gtg      2993
Asp Val Pro Leu Glu Asn Cys Met Glu Pro Ile Ser Ala Phe Ala Val
    795                 800                 805

gac atc cca gaa acc cat ggg gga gag ggc tat gaa gat gag att gat      3041
Asp Ile Pro Glu Thr His Gly Gly Glu Gly Tyr Glu Asp Glu Ile Asp
810                 815                 820                 825

gat gaa tat gaa gga gat tgg agc aac tct tct tcc tct acc tca ggg      3089
Asp Glu Tyr Glu Gly Asp Trp Ser Asn Ser Ser Ser Ser Thr Ser Gly
                830                 835                 840

gct ggt gac ccc tca tct ggc aaa gaa aag agc tgg ctg tac acc cta      3137
Ala Gly Asp Pro Ser Ser Gly Lys Glu Lys Ser Trp Leu Tyr Thr Leu
            845                 850                 855

gat ccc att ctg atc acc atc atc gcc atg agc tcg ctg ggg gtc ctg      3185
Asp Pro Ile Leu Ile Thr Ile Ile Ala Met Ser Ser Leu Gly Val Leu
        860                 865                 870

ctg ggg gcc acc tgt gcg ggc ctc ctc ctt tac tgc acc tgc tcc tat      3233
Leu Gly Ala Thr Cys Ala Gly Leu Leu Leu Tyr Cys Thr Cys Ser Tyr
    875                 880                 885

tcg ggt ctg agt tcg agg agc tgc acc aca ctg gag aac tac aac ttt      3281
Ser Gly Leu Ser Ser Arg Ser Cys Thr Thr Leu Glu Asn Tyr Asn Phe
890                 895                 900                 905

gag ctc tac gat ggc ctc aag cac aag gtc aag atc aat cat cag aag      3329
Glu Leu Tyr Asp Gly Leu Lys His Lys Val Lys Ile Asn His Gln Lys
                910                 915                 920

tgc tgc tcg gag gca tga ccgattgtgt ctggatcgct tctggcgttt             3377
Cys Cys Ser Glu Ala
            925

cattccagtg agaggggcta gcgaagatta cagttttgtt ttgttttgtt ttgttttccc   3437

tttggaaact gaatgccata atctggatca aagtgttcca gaatactgaa ggtatggaca   3497

ggacagacag gccagtctag ggagaaaggg agatgcagct gtgaagggga tcgttgccca   3557

ccaggactgt ggtggccaag tgaatgcagg aaccgggccc ggaattccgg ctctcggcta   3617
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aattgctggt gtgtatatgg aaaaggggga cacatatcca tggatggtag aagtgtaaac 4697

tgtgcagtca ctgtggacat caatatgcag gttcttcaca aatgtagata taaagctact 4757

atagttatac cc 4769

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Asn Ser Lys Asp Ala Gly Tyr Ile Thr Ser Pro Gly Tyr Pro Gln Asp
35 40 45

Tyr Pro Ser His Gln Asn Cys Glu Trp Ile Val Tyr Ala Pro Glu Pro
50 55 60

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Asn Gln Lys Ile Val Leu Asn Phe Asn Pro His Phe Glu Ile Glu Lys
65                  70                  75                  80

His Asp Cys Lys Tyr Asp Phe Ile Glu Ile Arg Asp Gly Asp Ser Glu
                85                  90                  95

Ser Ala Asp Leu Leu Gly Lys His Cys Gly Asn Ile Ala Pro Pro Thr
            100                 105                 110

Ile Ile Ser Ser Gly Ser Val Leu Tyr Ile Lys Phe Thr Ser Asp Tyr
        115                 120                 125

Ala Arg Gln Gly Ala Gly Phe Ser Leu Arg Tyr Glu Ile Phe Lys Thr
    130                 135                 140

Gly Ser Glu Asp Cys Ser Lys Asn Phe Thr Ser Pro Asn Gly Thr Ile
145                 150                 155                 160

Glu Ser Pro Gly Phe Pro Glu Lys Tyr Pro His Asn Leu Asp Cys Thr
                165                 170                 175

Phe Thr Ile Leu Ala Lys Pro Arg Met Glu Ile Ile Leu Gln Phe Leu
            180                 185                 190

Thr Phe Asp Leu Glu His Asp Pro Leu Gln Val Gly Glu Gly Asp Cys
        195                 200                 205

Lys Tyr Asp Trp Leu Asp Ile Trp Asp Gly Ile Pro His Val Gly Pro
    210                 215                 220

Leu Ile Gly Lys Tyr Cys Gly Thr Lys Thr Pro Ser Lys Leu Arg Ser
225                 230                 235                 240

Ser Thr Gly Ile Leu Ser Leu Thr Phe His Thr Asp Met Ala Val Ala
                245                 250                 255

Lys Asp Gly Phe Ser Ala Arg Tyr Tyr Leu Ile His Gln Glu Pro Pro
            260                 265                 270

Glu Asn Phe Gln Cys Asn Val Pro Leu Gly Met Glu Ser Gly Arg Ile
        275                 280                 285

Ala Asn Glu Gln Ile Ser Ala Ser Ser Thr Phe Ser Asp Gly Arg Trp
    290                 295                 300

Thr Pro Gln Gln Ser Arg Leu His Gly Asp Asp Asn Gly Trp Thr Pro
305                 310                 315                 320
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Asn Leu Asp Ser Asn Lys Glu Tyr Leu Gln Val Asp Leu Arg Phe Leu
325 330 335

Thr Met Leu Thr Ala Ile Ala Thr Gln Gly Ala Ile Ser Arg Glu Thr
340 345 350

Gln Lys Gly Tyr Tyr Val Lys Ser Tyr Lys Leu Glu Val Ser Thr Asn
355 360 365

Gly Glu Asp Trp Met Val Tyr Arg His Gly Lys Asn His Lys Ile Phe
370 375 380

Gln Ala Asn Asn Asp Ala Thr Glu Val Val Leu Asn Lys Leu His Met
385 390 395 400

Pro Leu Leu Thr Arg Phe Ile Arg Ile Arg Pro Gln Thr Trp His Leu
405 410 415

Gly Ile Ala Leu Arg Leu Glu Leu Phe Gly Cys Arg Val Thr Asp Ala
420 425 430

Pro Cys Ser Asn Met Leu Gly Met Leu Ser Gly Leu Ile Ala Asp Thr
435 440 445

Gln Ile Ser Ala Ser Ser Thr Arg Glu Tyr Leu Trp Ser Pro Ser Ala
450 455 460

Ala Arg Leu Val Ser Ser Arg Ser Gly Trp Phe Pro Arg Asn Pro Gln
465 470 475 480

Ala Gln Pro Gly Glu Glu Trp Leu Gln Val Asp Leu Gly Thr Pro Lys
485 490 495

Thr Val Lys Gly Val Ile Ile Gln Gly Ala Arg Gly Gly Asp Ser Ile
500 505 510

Thr Ala Val Glu Ala Arg Ala Phe Val Arg Lys Phe Lys Val Ser Tyr
515 520 525

Ser Leu Asn Gly Lys Asp Trp Glu Tyr Ile Gln Asp Pro Arg Thr Gln
530 535 540

Gln Thr Lys Leu Phe Glu Gly Asn Met His Tyr Asp Thr Pro Asp Ile
545 550 555 560

Arg Arg Phe Asp Pro Val Pro Ala Gln Tyr Val Arg Val Tyr Pro Glu
565 570 575

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Arg Trp Ser Pro Ala Gly Ile Gly Met Arg Leu Glu Val Leu Gly Cys
            580                 585                 590

Asp Trp Thr Asp Ser Lys Pro Thr Val Glu Thr Leu Gly Pro Thr Val
        595                 600                 605

Lys Ser Glu Glu Thr Thr Thr Pro Tyr Pro Met Asp Glu Asp Ala Thr
    610                 615                 620

Glu Cys Gly Glu Asn Cys Ser Phe Glu Asp Asp Lys Asp Leu Gln Leu
625                 630                 635                 640

Pro Ser Gly Phe Asn Cys Asn Phe Asp Phe Pro Glu Glu Thr Cys Gly
                645                 650                 655

Trp Val Tyr Asp His Ala Lys Trp Leu Arg Ser Thr Trp Ile Ser Ser
            660                 665                 670

Ala Asn Pro Asn Asp Arg Thr Phe Pro Asp Asp Lys Asn Phe Leu Lys
        675                 680                 685

Leu Gln Ser Asp Gly Arg Arg Glu Gly Gln Tyr Gly Arg Leu Ile Ser
    690                 695                 700

Pro Pro Val His Leu Pro Arg Ser Pro Val Cys Met Glu Phe Gln Tyr
705                 710                 715                 720

Gln Ala Met Gly Gly His Gly Val Ala Leu Gln Val Val Arg Glu Ala
                725                 730                 735

Ser Gln Glu Ser Lys Leu Leu Trp Val Ile Arg Glu Asp Gln Gly Ser
            740                 745                 750

Glu Trp Lys His Gly Arg Ile Ile Leu Pro Ser Tyr Asp Met Glu Tyr
        755                 760                 765

Gln Ile Val Phe Glu Gly Val Ile Gly Lys Gly Arg Ser Gly Glu Ile
    770                 775                 780

Ser Gly Asp Asp Ile Arg Ile Ser Thr Asp Val Pro Leu Glu Asn Cys
785                 790                 795                 800

Met Glu Pro Ile Ser Ala Phe Ala Val Asp Ile Pro Glu Thr His Gly
                805                 810                 815

Gly Glu Gly Tyr Glu Asp Glu Ile Asp Asp Glu Tyr Glu Gly Asp Trp
            820                 825                 830
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Ser Asn Ser Ser Ser Ser Thr Ser Gly Ala Gly Asp Pro Ser Ser Gly
        835                 840                 845

Lys Glu Lys Ser Trp Leu Tyr Thr Leu Asp Pro Ile Leu Ile Thr Ile
    850                 855                 860

Ile Ala Met Ser Ser Leu Gly Val Leu Leu Gly Ala Thr Cys Ala Gly
865                 870                 875                 880

Leu Leu Leu Tyr Cys Thr Cys Ser Tyr Ser Gly Leu Ser Ser Arg Ser
                885                 890                 895

Cys Thr Thr Leu Glu Asn Tyr Asn Phe Glu Leu Tyr Asp Gly Leu Lys
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His Lys Val Lys Ile Asn His Gln Lys Cys Cys Ser Glu Ala
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gga gta tta ctt aca gca aga gca aac tat cag aat ggg aag aac aat      99
Gly Val Leu Leu Thr Ala Arg Ala Asn Tyr Gln Asn Gly Lys Asn Asn
        15                  20                  25

gtg cca agg ctg aaa tta tcc tac aaa gaa atg ttg gaa tcc aac aat     147
Val Pro Arg Leu Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn
    30                  35                  40

gtg atc act ttc aat ggc ttg gcc aac agc tcc agt tat cat acc ttc     195
Val Ile Thr Phe Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe
45                  50                  55                  60

ctt ttg gat gag gaa cgg agt agg ctg tat gtt gga gca aag gat cac     243
Leu Leu Asp Glu Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His
                65                  70                  75

ata ttt tca ttc gac ctg gtt aat atc aag gat ttt caa aag att gtg     291
Ile Phe Ser Phe Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val
            80                  85                  90

tgg cca gta tct tac acc aga aga gat gaa tgc aag tgg gct gga aaa     339
Trp Pro Val Ser Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys
        95                  100                 105
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gac atc ctg aaa gaa tgt gct aat ttc atc aag gta ctt aag gca tat      387
Asp Ile Leu Lys Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr
    110                 115                 120

aat cag act cac ttg tac gcc tgt gga acg ggg gct ttt cat cca att      435
Asn Gln Thr His Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile
125                 130                 135                 140

tgc acc tac att gaa att gga cat cat cct gag gac aat att ttt aag      483
Cys Thr Tyr Ile Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys
                145                 150                 155

ctg gag aac tca cat ttt gaa aac ggc cgt ggg aag agt cca tat gac      531
Leu Glu Asn Ser His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp
            160                 165                 170

cct aag ctg ctg aca gca tcc ctt tta ata gat gga gaa tta tac tct      579
Pro Lys Leu Leu Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser
        175                 180                 185

gga act gca gct gat ttt atg ggg cga gac ttt gct atc ttc cga act      627
Gly Thr Ala Ala Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr
    190                 195                 200

ctt ggg cac cac cac cca atc agg aca gag cag cat gat tcc agg tgg      675
Leu Gly His His His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp
205                 210                 215                 220

ctc aat gat cca aag ttc att agt gcc cac ctc atc tca gag agt gac      723
Leu Asn Asp Pro Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp
                225                 230                 235

aat cct gaa gat gac aaa gta tac ttt ttc ttc cgt gaa aat gca ata      771
Asn Pro Glu Asp Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile
            240                 245                 250

gat gga gaa cac tct gga aaa gct act cac gct aga ata ggt cag ata      819
Asp Gly Glu His Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile
        255                 260                 265

tgc aag aat gac ttt gga ggg cac aga agt ctg gtg aat aaa tgg aca      867
Cys Lys Asn Asp Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr
    270                 275                 280

aca ttc ctc aaa gct cgt ctg att tgc tca gtg cca ggt cca aat ggc      915
Thr Phe Leu Lys Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly
285                 290                 295                 300

att gac act cat ttt gat gaa ctg cag gat gta ttc cta atg aac ttt      963
Ile Asp Thr His Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Phe
                305                 310                 315

aaa gat cct aaa aat cca gtt gta tat gga gtg ttt acg act tcc agt      1011
Lys Asp Pro Lys Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser
            320                 325                 330

aac att ttc aag gga tca gcc gtg tgt atg tat agc atg agt gat gtg      1059
Asn Ile Phe Lys Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val
        335                 340                 345

aga agg gtg ttc ctt ggt cca tat gcc cac agg gat gga ccc aac tat      1107
Arg Arg Val Phe Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr
    350                 355                 360
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caa tgg gtg cct tat caa gga aga gtc ccc tat cca cgg cca gga act     1155
Gln Trp Val Pro Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr
365                 370                 375                 380

tgt ccc agc aaa aca ttt ggt ggt ttt gac tct aca aag gac ctt cct     1203
Cys Pro Ser Lys Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro
                385                 390                 395

gat gat gtt ata acc ttt gca aga agt cat cca gcc atg tac aat cca     1251
Asp Asp Val Ile Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro
            400                 405                 410

gtg ttt cct atg aac aat cgc cca ata gtg atc aaa acg gat gta aat     1299
Val Phe Pro Met Asn Asn Arg Pro Ile Val Ile Lys Thr Asp Val Asn
        415                 420                 425

tat caa ttt aca caa att gtc gta gac cga gtg gat gca gaa gat gga     1347
Tyr Gln Phe Thr Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly
    430                 435                 440

cag tat gat gtt atg ttt atc gga aca gat gtt ggg acc gtt ctt aaa     1395
Gln Tyr Asp Val Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys
445                 450                 455                 460

gta gtt tca att cct aag gag act tgg tat gat tta gaa gag gtt ctg     1443
Val Val Ser Ile Pro Lys Glu Thr Trp Tyr Asp Leu Glu Glu Val Leu
                465                 470                 475

ctg gaa gaa atg aca gtt ttt cgg gaa ccg act gct att tca gca atg     1491
Leu Glu Glu Met Thr Val Phe Arg Glu Pro Thr Ala Ile Ser Ala Met
            480                 485                 490

gag ctt tcc act aag cag caa caa cta tat att ggt tca acg gct ggg     1539
Glu Leu Ser Thr Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly
        495                 500                 505

gtt gcc cag ctc cct tta cac cgg tgt gat att tac ggg aaa gcg tgt     1587
Val Ala Gln Leu Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys
    510                 515                 520

gct gag tgt tgc ctc gcc cga gac cct tac tgt gct tgg gat ggt tct     1635
Ala Glu Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser
525                 530                 535                 540

gca tgt tct cgc tat ttt ccc act gca aag aga cgc aca aga cga caa     1683
Ala Cys Ser Arg Tyr Phe Pro Thr Ala Lys Arg Arg Thr Arg Arg Gln
                545                 550                 555

gat ata aga aat gga gac cca ctg act cac tgt tca gac tta cac cat     1731
Asp Ile Arg Asn Gly Asp Pro Leu Thr His Cys Ser Asp Leu His His
            560                 565                 570

gat aat cac cat ggc cac agc cct gaa gag aga atc atc tat ggt gta     1779
Asp Asn His His Gly His Ser Pro Glu Glu Arg Ile Ile Tyr Gly Val
        575                 580                 585

gag aat agt agc aca ttt ttg gaa tgc agt ccg aag tcg cag aga gcg     1827
Glu Asn Ser Ser Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala
    590                 595                 600

ctg gtc tat tgg caa ttc cag agg cga aat gaa gag cga aaa gaa gag     1875
Leu Val Tyr Trp Gln Phe Gln Arg Arg Asn Glu Glu Arg Lys Glu Glu
605                 610                 615                 620
```

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atc aga gtg gat gat cat atc atc agg aca gat caa ggc ctt ctg cta     1923
Ile Arg Val Asp Asp His Ile Ile Arg Thr Asp Gln Gly Leu Leu Leu
                625                 630                 635

cgt agt cta caa cag aag gat tca ggc aat tac ctc tgc cat gcg gtg     1971
Arg Ser Leu Gln Gln Lys Asp Ser Gly Asn Tyr Leu Cys His Ala Val
            640                 645                 650

gaa cat ggg ttc ata caa act ctt ctt aag gta acc ctg gaa gtc att     2019
Glu His Gly Phe Ile Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile
        655                 660                 665

gac aca gag cat ttg gaa gaa ctt ctt cat aaa gat gat gat gga gat     2067
Asp Thr Glu His Leu Glu Glu Leu Leu His Lys Asp Asp Asp Gly Asp
    670                 675                 680

ggc tct aag acc aaa gaa atg tcc aat agc atg aca cct agc cag aag     2115
Gly Ser Lys Thr Lys Glu Met Ser Asn Ser Met Thr Pro Ser Gln Lys
685                 690                 695                 700

gtc tgg tac aga gac ttc atg cag ctc atc aac cac ccc aat ctc aac     2163
Val Trp Tyr Arg Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn
                705                 710                 715

acg atg gat gag ttc tgt gaa caa gtt tgg aaa agg gac cga aaa caa     2211
Thr Met Asp Glu Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln
            720                 725                 730

cgt cgg caa agg cca gga cat acc cca ggg aac agt aac aaa tgg aag     2259
Arg Arg Gln Arg Pro Gly His Thr Pro Gly Asn Ser Asn Lys Trp Lys
        735                 740                 745

cac tta caa gaa aat aag aaa ggt aga aac agg agg acc cac gaa ttt     2307
His Leu Gln Glu Asn Lys Lys Gly Arg Asn Arg Arg Thr His Glu Phe
    750                 755                 760

gag agg gca ccc agg agt gtc tga gctgcattac ctctagaaac ctcaaacaag    2361
Glu Arg Ala Pro Arg Ser Val
765                 770

tagaaacttg cctagacaat aactggaaaa acaaatgcaa tatacatgaa ctttttttcat   2421

ggcattatgt ggatgtttac aatggtggga aattcagctg agttccacca attataaatt   2481

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<213> Homo sapiens

<400> 10

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Thr Ala Arg Ala Asn Tyr Gln Asn Gly Lys Asn Asn Val Pro Arg Leu
            20                  25                  30
```

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Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe
        35                  40                  45

Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu
    50                  55                  60

Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe
65                  70                  75                  80

Asp Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser
                85                  90                  95

Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys
            100                 105                 110

Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His
        115                 120                 125

Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
    130                 135                 140

Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser
145                 150                 155                 160

His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
                165                 170                 175

Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
            180                 185                 190

Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
        195                 200                 205

His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
    210                 215                 220

Lys Phe Ile Ser Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp
225                 230                 235                 240

Asp Lys Val Tyr Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
                245                 250                 255

Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
            260                 265                 270

Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
        275                 280                 285
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```
Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
    290                 295                 300

Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys
305                 310                 315                 320

Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
                325                 330                 335

Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
            340                 345                 350

Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
        355                 360                 365

Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
    370                 375                 380

Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
385                 390                 395                 400

Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Met
                405                 410                 415

Asn Asn Arg Pro Ile Val Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
            420                 425                 430

Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
        435                 440                 445

Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile
    450                 455                 460

Pro Lys Glu Thr Trp Tyr Asp Leu Glu Glu Val Leu Leu Glu Glu Met
465                 470                 475                 480

Thr Val Phe Arg Glu Pro Thr Ala Ile Ser Ala Met Glu Leu Ser Thr
                485                 490                 495

Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu
            500                 505                 510

Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
        515                 520                 525

Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg
    530                 535                 540
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Tyr Phe Pro Thr Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn
545                 550                 555                 560

Gly Asp Pro Leu Thr His Cys Ser Asp Leu His His Asp Asn His His
                565                 570                 575

Gly His Ser Pro Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser
            580                 585                 590

Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp
        595                 600                 605

Gln Phe Gln Arg Arg Asn Glu Glu Arg Lys Glu Glu Ile Arg Val Asp
    610                 615                 620

Asp His Ile Ile Arg Thr Asp Gln Gly Leu Leu Leu Arg Ser Leu Gln
625                 630                 635                 640

Gln Lys Asp Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe
                645                 650                 655

Ile Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His
            660                 665                 670

Leu Glu Glu Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Thr
        675                 680                 685

Lys Glu Met Ser Asn Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg
    690                 695                 700

Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu
705                 710                 715                 720

Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg
                725                 730                 735

Pro Gly His Thr Pro Gly Asn Ser Asn Lys Trp Lys His Leu Gln Glu
            740                 745                 750

Asn Lys Lys Gly Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala Pro
        755                 760                 765

Arg Ser Val
    770
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<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (236)..(2485)

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cccgccctcg ccctcactgc tgactcctct tccagatcct ggggcagagt ccagggcagc 180

tcaaggctcc tccacacaca cacccgctga accctgagca ccctgagctg ctgag atg 238
Met
1

ggg cgg gcc ggg gct gcc gcc gtg atc ccg ggc ctg gcc ctg ctc tgg 286
Gly Arg Ala Gly Ala Ala Ala Val Ile Pro Gly Leu Ala Leu Leu Trp
5 10 15

gca gtg ggg ctg ggg agt gcc gcc ccc agc ccc cca cgc ctt cgg ctc 334
Ala Val Gly Leu Gly Ser Ala Ala Pro Ser Pro Pro Arg Leu Arg Leu
20 25 30

tcc ttc caa gag ctc cag gcc tgg cat ggt ctc cag act ttc agc ctg 382
Ser Phe Gln Glu Leu Gln Ala Trp His Gly Leu Gln Thr Phe Ser Leu
35 40 45

gag cga acc tgc tgc tac cag gcc ttg ctg gtg gat gag gag cgt gga 430
Glu Arg Thr Cys Cys Tyr Gln Ala Leu Leu Val Asp Glu Glu Arg Gly
50 55 60 65

cgc ctg ttt gtg ggt gcc gag aac cat gtg gcc tcc ctc aac ctg gac 478
Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Asn Leu Asp
70 75 80

aac atc agc aag cgg gcc aag aag ctg gcc tgg ccg gcc cct gtg gaa 526
Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val Glu
85 90 95

tgg cga gag gag tgc aac tgg gca ggg aag gac att ggt act gag tgc 574
Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu Cys
100 105 110

atg aac ttc gtg aag ttg ctg cat gcc tac aac cgc acc cat ttg ctg 622
Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr His Leu Leu
115 120 125

gcc tgt ggc acg gga gcc ttc cac cca acc tgt gcc ttt gtg gaa gtg 670
Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu Val
130 135 140 145

ggc cac cgg gca gag gag ccc gtc ctc cgg ctg gac cca gga agg ata 718
Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro Gly Arg Ile
150 155 160

gag gat ggc aag ggg aag agt cct tat gac ccc agg cat cgg gct gcc 766
Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His Arg Ala Ala
165 170 175

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tcc gtg ctg gtg ggg gag gag cta tac tca ggg gtg gca gca gac ctc      814
Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala Ala Asp Leu
        180                 185                 190

atg gga cga gac ttt acc atc ttt cgc agc cta ggg caa cgt cca agt      862
Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Arg Pro Ser
    195                 200                 205

ctc cga aca gag cca cac gac tcc cgc tgg ctc aat gag ccc aag ttt      910
Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys Phe
210                 215                 220                 225

gtc aag gta ttt tgg atc ccg gag agc gag aac cca gac gac gac aaa      958
Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp Lys
                230                 235                 240

atc tac ttc ttc ttt cgt gag acg gcg gta gag gcg gcg ccg gca ctg     1006
Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala Pro Ala Leu
            245                 250                 255

gga cgc ctg tcc gtg tcc cgc gtt ggc cag atc tgc cgg aac gac gtg     1054
Gly Arg Leu Ser Val Ser Arg Val Gly Gln Ile Cys Arg Asn Asp Val
        260                 265                 270

ggc ggc cag cgc agc ctg gtc aac aag tgg acg acg ttc ctg aag gcg     1102
Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala
    275                 280                 285

cgg ctg gtg tgc tcg gtg ccc ggc gtc gag ggc gac acc cac ttc gat     1150
Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe Asp
290                 295                 300                 305

cag ctc cag gat gtg ttt ctg ttg tcc tcg cgg gac cac cgg acc ccg     1198
Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His Arg Thr Pro
                310                 315                 320

ctg ctc tat gcc gtc ttc tcc acg tcc agc agc atc ttc cag ggc tct     1246
Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe Gln Gly Ser
            325                 330                 335

gcg gtg tgc gtg tac agc atg aac gac gtg cgc cgg gcc ttc ttg gga     1294
Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu Gly
        340                 345                 350

ccc ttt gca cac aag gag ggg ccc atg cac cag tgg gtg tca tac cag     1342
Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val Ser Tyr Gln
    355                 360                 365

ggt cgc gtc ccc tac ccg cgg cca ggc atg tgc ccc agc aag acc ttt     1390
Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr Phe
370                 375                 380                 385

ggc acc ttc agt tcc acc aag gac ttc cca gac gat gtc atc cag ttt     1438
Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln Phe
                390                 395                 400

gcg cgg aac cac ccc ctc atg tac aac tct gtc ctg ccc act ggg ggg     1486
Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro Thr Gly Gly
            405                 410                 415

cgc cct ctt ttc cta caa gtt gga gcc aat tac acc ttc act caa att     1534
Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe Thr Gln Ile
        420                 425                 430
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gcc gcg gac cgg gtt gca gcc gct gac gga cac tat gac gtc ctc ttc      1582
Ala Ala Asp Arg Val Ala Ala Asp Gly His Tyr Asp Val Leu Phe
    435                 440                 445

att ggc aca gac gtt ggc acg gtg ctg aag gtg atc tcg gtc ccc aag      1630
Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro Lys
450                 455                 460                 465

ggc agt agg ccc agc gca gag ggg ctg ctc ctg gag gag ctg cac gtg      1678
Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu Leu His Val
                470                 475                 480

ttt gag gac tcg gcc gct gtc acc agc atg caa att tct tcc aag agg      1726
Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser Ser Lys Arg
            485                 490                 495

cac cag ctg tac gta gcc tcg cgg agc gcg gtg gcc cag atc gcg ttg      1774
His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln Ile Ala Leu
        500                 505                 510

cac cgc tgc gct gcc cac ggc cgc gtc tgc acc gaa tgc tgt ctg gcg      1822
His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys Cys Leu Ala
    515                 520                 525

cgt gac ccc tac tgc gcc tgg gac ggg gtc gcg tgc acg cgc ttc cag      1870
Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr Arg Phe Gln
530                 535                 540                 545

ccc agt gcc aag agg cgg ttc cgg cgg caa gac gta agg aat ggc gac      1918
Pro Ser Ala Lys Arg Arg Phe Arg Arg Gln Asp Val Arg Asn Gly Asp
                550                 555                 560

ccc agc acg ttg tgc tcc gga gac tcg tct cgt ccc gcg ctg ctg gaa      1966
Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser Arg Pro Ala Leu Leu Glu
            565                 570                 575

cac aag gtg ttc ggc gtg gag ggc agc agc gcc ttt ctg gag tgt gag      2014
His Lys Val Phe Gly Val Glu Gly Ser Ser Ala Phe Leu Glu Cys Glu
        580                 585                 590

ccc cgc tcg ctg cag gcg cgc gtg gag tgg act ttc cag cgc gca ggg      2062
Pro Arg Ser Leu Gln Ala Arg Val Glu Trp Thr Phe Gln Arg Ala Gly
    595                 600                 605

gtg aca gcc cac acc cag gtg ctg gca gag gag cgc acc gag cgc acc      2110
Val Thr Ala His Thr Gln Val Leu Ala Glu Glu Arg Thr Glu Arg Thr
610                 615                 620                 625

gcc cgg gga cta ctg ctg cgc agg ctg cgg cgc cgg gac tcg ggc gtg      2158
Ala Arg Gly Leu Leu Leu Arg Arg Leu Arg Arg Arg Asp Ser Gly Val
                630                 635                 640

tac ttg tgc gcc gcc gtc gag cag ggc ttt acg caa ccg ctg cgt cgc      2206
Tyr Leu Cys Ala Ala Val Glu Gln Gly Phe Thr Gln Pro Leu Arg Arg
            645                 650                 655

ctg tcg ctg cac gtg ttg agt gct acg cag gcc gaa cga ctg gcg cgg      2254
Leu Ser Leu His Val Leu Ser Ala Thr Gln Ala Glu Arg Leu Ala Arg
        660                 665                 670

gcc gag gag gct gcg ccc gcc gcg ccg ccg ggc ccc aaa ctc tgg tac      2302
Ala Glu Glu Ala Ala Pro Ala Ala Pro Pro Gly Pro Lys Leu Trp Tyr
    675                 680                 685
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cgg gac ttt ctg cag ctg gtg gag ccg ggc gga ggt ggc agc gcg aac     2350
Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly Ser Ala Asn
690                 695                 700                 705

tcc ctg cgc atg tgc cgc ccg cag cct gcg ctg cag tca ctg ccc ctg     2398
Ser Leu Arg Met Cys Arg Pro Gln Pro Ala Leu Gln Ser Leu Pro Leu
                710                 715                 720

gag tcg cgg aga aag ggc cgt aac cgg agg acc cac gcc cct gag cct     2446
Glu Ser Arg Arg Lys Gly Arg Asn Arg Arg Thr His Ala Pro Glu Pro
            725                 730                 735

cgc gct gag cgg ggg ccg cgc agc gca acg cac tgg tga ccagactgtc      2495
Arg Ala Glu Arg Gly Pro Arg Ser Ala Thr His Trp
        740                 745

cccacgccgg gaaccaagca ggagacgaca ggcgagagag gagccagaca gaccctgaaa   2555

agaaggacgg gttggggccg ggcacattgg gggtcaccgg ccgatggaga caccaaccga   2615

caggccctgg ctgagggcag ctgcgcgggc ttatttatta acaggataac ccttgaatgt   2675

agcagccccg ggagggcggc acaggtcggg cgcaggattc agccggaggg aagggacggg   2735

gaagccgagc tccagagcaa cgaccagggc cgaggaggtg cctggagtgc ccaccctggg   2795

agacagaccc cacctccttg ggtagtgagc agtgagcaga aagctgtgaa caggctgggc   2855

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gcca                                                                2919
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<210> 12
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<400> 12

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Trp Ala Val Gly Leu Gly Ser Ala Ala Pro Ser Pro Pro Arg Leu Arg
            20                  25                  30

Leu Ser Phe Gln Glu Leu Gln Ala Trp His Gly Leu Gln Thr Phe Ser
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Leu Glu Arg Thr Cys Cys Tyr Gln Ala Leu Leu Val Asp Glu Glu Arg
    50                  55                  60

Gly Arg Leu Phe Val Gly Ala Glu Asn His Val Ala Ser Leu Asn Leu
65                  70                  75                  80

Asp Asn Ile Ser Lys Arg Ala Lys Lys Leu Ala Trp Pro Ala Pro Val
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Glu Trp Arg Glu Glu Cys Asn Trp Ala Gly Lys Asp Ile Gly Thr Glu
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Cys Met Asn Phe Val Lys Leu Leu His Ala Tyr Asn Arg Thr His Leu
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Leu Ala Cys Gly Thr Gly Ala Phe His Pro Thr Cys Ala Phe Val Glu
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Val Gly His Arg Ala Glu Glu Pro Val Leu Arg Leu Asp Pro Gly Arg
145 150 155 160

Ile Glu Asp Gly Lys Gly Lys Ser Pro Tyr Asp Pro Arg His Arg Ala
165 170 175

Ala Ser Val Leu Val Gly Glu Glu Leu Tyr Ser Gly Val Ala Ala Asp
180 185 190

Leu Met Gly Arg Asp Phe Thr Ile Phe Arg Ser Leu Gly Gln Arg Pro
195 200 205

Ser Leu Arg Thr Glu Pro His Asp Ser Arg Trp Leu Asn Glu Pro Lys
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Phe Val Lys Val Phe Trp Ile Pro Glu Ser Glu Asn Pro Asp Asp Asp
225 230 235 240

Lys Ile Tyr Phe Phe Phe Arg Glu Thr Ala Val Glu Ala Ala Pro Ala
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260 265 270

Val Gly Gly Gln Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
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Ala Arg Leu Val Cys Ser Val Pro Gly Val Glu Gly Asp Thr His Phe
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Asp Gln Leu Gln Asp Val Phe Leu Leu Ser Ser Arg Asp His Arg Thr
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Pro Leu Leu Tyr Ala Val Phe Ser Thr Ser Ser Ser Ile Phe Gln Gly
325 330 335

Ser Ala Val Cys Val Tyr Ser Met Asn Asp Val Arg Arg Ala Phe Leu
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Gly Pro Phe Ala His Lys Glu Gly Pro Met His Gln Trp Val Ser Tyr
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Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Met Cys Pro Ser Lys Thr
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Phe Gly Thr Phe Ser Ser Thr Lys Asp Phe Pro Asp Asp Val Ile Gln
385                 390                 395                 400

Phe Ala Arg Asn His Pro Leu Met Tyr Asn Ser Val Leu Pro Thr Gly
                405                 410                 415

Gly Arg Pro Leu Phe Leu Gln Val Gly Ala Asn Tyr Thr Phe Thr Gln
            420                 425                 430

Ile Ala Ala Asp Arg Val Ala Ala Ala Asp Gly His Tyr Asp Val Leu
        435                 440                 445

Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Ile Ser Val Pro
    450                 455                 460

Lys Gly Ser Arg Pro Ser Ala Glu Gly Leu Leu Leu Glu Glu Leu His
465                 470                 475                 480

Val Phe Glu Asp Ser Ala Ala Val Thr Ser Met Gln Ile Ser Ser Lys
                485                 490                 495

Arg His Gln Leu Tyr Val Ala Ser Arg Ser Ala Val Ala Gln Ile Ala
            500                 505                 510

Leu His Arg Cys Ala Ala His Gly Arg Val Cys Thr Glu Cys Cys Leu
        515                 520                 525

Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Val Ala Cys Thr Arg Phe
    530                 535                 540

Gln Pro Ser Ala Lys Arg Arg Phe Arg Arg Gln Asp Val Arg Asn Gly
545                 550                 555                 560

Asp Pro Ser Thr Leu Cys Ser Gly Asp Ser Ser Arg Pro Ala Leu Leu
                565                 570                 575

Glu His Lys Val Phe Gly Val Glu Gly Ser Ser Ala Phe Leu Glu Cys
            580                 585                 590

Glu Pro Arg Ser Leu Gln Ala Arg Val Glu Trp Thr Phe Gln Arg Ala
        595                 600                 605
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Gly Val Thr Ala His Thr Gln Val Leu Ala Glu Glu Arg Thr Glu Arg
610 615 620

Thr Ala Arg Gly Leu Leu Leu Arg Arg Leu Arg Arg Arg Asp Ser Gly
625 630 635 640

Val Tyr Leu Cys Ala Ala Val Glu Gln Gly Phe Thr Gln Pro Leu Arg
645 650 655

Arg Leu Ser Leu His Val Leu Ser Ala Thr Gln Ala Glu Arg Leu Ala
660 665 670

Arg Ala Glu Glu Ala Ala Pro Ala Ala Pro Pro Gly Pro Lys Leu Trp
675 680 685

Tyr Arg Asp Phe Leu Gln Leu Val Glu Pro Gly Gly Gly Gly Ser Ala
690 695 700

Asn Ser Leu Arg Met Cys Arg Pro Gln Pro Ala Leu Gln Ser Leu Pro
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Leu Glu Ser Arg Arg Lys Gly Arg Asn Arg Arg Thr His Ala Pro Glu
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gctgcgcggt ggtgatgcga gcctgctggg cggcgcgccg gggcagccgg agccgcgcgc 240

cgcggcgctg taatcggaca ccaagagcgc tcgcccccgg cctccggcca ctttccattc 300

actccgaggt gcttgattga gcgacgcgga gaagagctcc gggtgccgcg gcactgcagc 360

gctgagattc ctttacaaag aaactcagag gaccgggaag aaagaatttc acctttgcga 420

cgtgctagaa aataaggtcg tctgggaaaa ggactggaga cacaagcgca tccaaccccg 480

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attaacttgc atatctgaag aa atg gca ttc cgg aca att tgc gtg ttg gtt      592
                          Met Ala Phe Arg Thr Ile Cys Val Leu Val
                          1               5                   10

gga gta ttt att tgt tct atc tgt gtg aaa gga tct tcc cag ccc caa      640
Gly Val Phe Ile Cys Ser Ile Cys Val Lys Gly Ser Ser Gln Pro Gln
                 15                  20                  25

gca aga gtt tat tta aca ttt gat gaa ctt cga gaa acc aag acc tct      688
Ala Arg Val Tyr Leu Thr Phe Asp Glu Leu Arg Glu Thr Lys Thr Ser
            30                  35                  40

gaa tac ttc agc ctt tcc cac cat cct tta gac tac agg att tta tta      736
Glu Tyr Phe Ser Leu Ser His His Pro Leu Asp Tyr Arg Ile Leu Leu
        45                  50                  55

atg gat gaa gat cag gac cgg ata tat gtg gga agc aaa gat cac att      784
Met Asp Glu Asp Gln Asp Arg Ile Tyr Val Gly Ser Lys Asp His Ile
    60                  65                  70

ctt tcc ctg aat att aac aat ata agt caa gaa gct ttg agt gtt ttc      832
Leu Ser Leu Asn Ile Asn Asn Ile Ser Gln Glu Ala Leu Ser Val Phe
75                  80                  85                  90

tgg cca gca tct aca atc aaa gtt gaa gaa tgc aaa atg gct ggc aaa      880
Trp Pro Ala Ser Thr Ile Lys Val Glu Glu Cys Lys Met Ala Gly Lys
                95                  100                 105

gat ccc aca cac ggc tgt ggg aac ttt gtc cgt gta att cag act ttc      928
Asp Pro Thr His Gly Cys Gly Asn Phe Val Arg Val Ile Gln Thr Phe
            110                 115                 120

aat cgc aca cat ttg tat gtc tgt ggg agt ggc gct ttc agt cct gtc      976
Asn Arg Thr His Leu Tyr Val Cys Gly Ser Gly Ala Phe Ser Pro Val
        125                 130                 135

tgt act tac ttg aac aga ggg agg aga tca gag gac caa gtt ttc atg     1024
Cys Thr Tyr Leu Asn Arg Gly Arg Arg Ser Glu Asp Gln Val Phe Met
    140                 145                 150

att gac tcc aag tgt gaa tct gga aaa gga cgc tgc tct ttc aac ccc     1072
Ile Asp Ser Lys Cys Glu Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro
155                 160                 165                 170

aac gtg aac acg gtg tct gtt atg atc aat gag gag ctt ttc tct gga     1120
Asn Val Asn Thr Val Ser Val Met Ile Asn Glu Glu Leu Phe Ser Gly
                175                 180                 185

atg tat ata gat ttc atg ggg aca gat gct gct att ttt cga agt tta     1168
Met Tyr Ile Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu
            190                 195                 200

acc aag agg aat gcg gtc aga act gat caa cat aat tcc aaa tgg cta     1216
Thr Lys Arg Asn Ala Val Arg Thr Asp Gln His Asn Ser Lys Trp Leu
        205                 210                 215

agt gaa cct atg ttt gta gat gca cat gtc atc cca gat ggt act gat     1264
Ser Glu Pro Met Phe Val Asp Ala His Val Ile Pro Asp Gly Thr Asp
    220                 225                 230
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cca aat gat gct aag gtg tac ttc ttc ttc aaa gaa aaa ctg act gac      1312
Pro Asn Asp Ala Lys Val Tyr Phe Phe Phe Lys Glu Lys Leu Thr Asp
235                 240                 245                 250

aat aac agg agc acg aaa cag att cat tcc atg att gct cga ata tgt      1360
Asn Asn Arg Ser Thr Lys Gln Ile His Ser Met Ile Ala Arg Ile Cys
                255                 260                 265

cct aat gac act ggt gga ctg cgt agc ctt gtc aac aag tgg acc act      1408
Pro Asn Asp Thr Gly Gly Leu Arg Ser Leu Val Asn Lys Trp Thr Thr
            270                 275                 280

ttc tta aag gcg agg ctg gtg tgc tcg gta aca gat gaa gac ggc cca      1456
Phe Leu Lys Ala Arg Leu Val Cys Ser Val Thr Asp Glu Asp Gly Pro
        285                 290                 295

gaa aca cac ttt gat gaa tta gag gat gtg ttt ctg ctg gaa act gat      1504
Glu Thr His Phe Asp Glu Leu Glu Asp Val Phe Leu Leu Glu Thr Asp
    300                 305                 310

aac ccg agg aca aca cta gtg tat ggc att ttt aca aca tca agc tca      1552
Asn Pro Arg Thr Thr Leu Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser
315                 320                 325                 330

gtt ttc aaa gga tca gcc gtg tgt gtg tat cat tta tct gat ata cag      1600
Val Phe Lys Gly Ser Ala Val Cys Val Tyr His Leu Ser Asp Ile Gln
                335                 340                 345

act gtg ttt aat ggg cct ttt gcc cac aaa gaa ggg ccc aat cat cag      1648
Thr Val Phe Asn Gly Pro Phe Ala His Lys Glu Gly Pro Asn His Gln
            350                 355                 360

ctg att tcc tat cag ggc aga att cca tat cct cgc cct gga act tgt      1696
Leu Ile Ser Tyr Gln Gly Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys
        365                 370                 375

cca gga gga gca ttt aca ccc aat atg cga acc acc aag gag ttc cca      1744
Pro Gly Gly Ala Phe Thr Pro Asn Met Arg Thr Thr Lys Glu Phe Pro
    380                 385                 390

gat gat gtt gtc act ttt att cgg aac cat cct ctc atg tac aat tcc      1792
Asp Asp Val Val Thr Phe Ile Arg Asn His Pro Leu Met Tyr Asn Ser
395                 400                 405                 410

atc tac cca atc cac aaa agg cct ttg att gtt cgt att ggc act gac      1840
Ile Tyr Pro Ile His Lys Arg Pro Leu Ile Val Arg Ile Gly Thr Asp
                415                 420                 425

tac aag tac aca aag ata gct gtg gat cga gtg aac gct gct gat ggg      1888
Tyr Lys Tyr Thr Lys Ile Ala Val Asp Arg Val Asn Ala Ala Asp Gly
            430                 435                 440

aga tac cat gtc ctg ttt ctc gga aca gat cgg ggt act gtg caa aaa      1936
Arg Tyr His Val Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys
        445                 450                 455

gtg gtt gtt ctt cct act aac aac tct gtc agt ggc gag ctc att ctg      1984
Val Val Val Leu Pro Thr Asn Asn Ser Val Ser Gly Glu Leu Ile Leu
    460                 465                 470

gag gag ctg gaa gtc ttt aag aat cat gct cct ata aca aca atg aaa      2032
Glu Glu Leu Glu Val Phe Lys Asn His Ala Pro Ile Thr Thr Met Lys
475                 480                 485                 490
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Ile Ser Ser Lys Lys Gln Gln Leu Tyr Val Ser Ser Asn Glu Gly Val
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tcc caa gta tct ctg cac cgc tgc cac atc tat ggt aca gcc tgt gct      2128
Ser Gln Val Ser Leu His Arg Cys His Ile Tyr Gly Thr Ala Cys Ala
            510                 515                 520

gac tgc tgc ctg gcg cgg gac cct tat tgc gcc tgg gat ggc cat tcc      2176
Asp Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly His Ser
        525                 530                 535

tgt tcc aga ttc tac cca act ggg aaa cgg agg agc cga aga caa gat      2224
Cys Ser Arg Phe Tyr Pro Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp
    540                 545                 550

gtg aga cat gga aac cca ctg act caa tgc aga gga ttt aat cta aaa      2272
Val Arg His Gly Asn Pro Leu Thr Gln Cys Arg Gly Phe Asn Leu Lys
555                 560                 565                 570

gca tac aga aat gca gct gaa att gtg cag tat gga gta aaa aat aac      2320
Ala Tyr Arg Asn Ala Ala Glu Ile Val Gln Tyr Gly Val Lys Asn Asn
                575                 580                 585

acc act ttt ctg gag tgt gcc ccc aag tct ccg cag gca tct atc aag      2368
Thr Thr Phe Leu Glu Cys Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys
            590                 595                 600

tgg ctg tta cag aaa gac aaa gac agg agg aaa gag gtt aag ctg aat      2416
Trp Leu Leu Gln Lys Asp Lys Asp Arg Arg Lys Glu Val Lys Leu Asn
        605                 610                 615

gaa cga ata ata gcc act tca cag gga ctc ctg atc cgc tct gtt cag      2464
Glu Arg Ile Ile Ala Thr Ser Gln Gly Leu Leu Ile Arg Ser Val Gln
    620                 625                 630

ggt tct gac caa gga ctt tat cac tgc att gct aca gaa aat agt ttc      2512
Gly Ser Asp Gln Gly Leu Tyr His Cys Ile Ala Thr Glu Asn Ser Phe
635                 640                 645                 650

aag cag acc ata gcc aag atc aac ttc aaa gtt tta gat tca gaa atg      2560
Lys Gln Thr Ile Ala Lys Ile Asn Phe Lys Val Leu Asp Ser Glu Met
                655                 660                 665

gtg gct gtt gtg acg gac aaa tgg tcc ccg tgg acc tgg gcc agc tct      2608
Val Ala Val Val Thr Asp Lys Trp Ser Pro Trp Thr Trp Ala Ser Ser
            670                 675                 680

gtg agg gct tta ccc ttc cac ccg aag gac atc atg ggg gca ttc agc      2656
Val Arg Ala Leu Pro Phe His Pro Lys Asp Ile Met Gly Ala Phe Ser
        685                 690                 695

cac tca gaa atg cag atg att aac caa tac tgc aaa gac act cgg cag      2704
His Ser Glu Met Gln Met Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln
    700                 705                 710

caa cat cag cag gga gat gaa tca cag aaa atg aga ggg gac tat ggc      2752
Gln His Gln Gln Gly Asp Glu Ser Gln Lys Met Arg Gly Asp Tyr Gly
715                 720                 725                 730

aag tta aag gcc ctc atc aat agt cgg aaa agt aga aac agg agg aat      2800
Lys Leu Lys Ala Leu Ile Asn Ser Arg Lys Ser Arg Asn Arg Arg Asn
                735                 740                 745
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cag ttg cca gag tca taa tattttctta tgtgggtctt atgcttccat 2848
Gln Leu Pro Glu Ser
750

taacaaatgc tctgtcttca atgatcaaat tttgagcaaa gaaacttgtg ctttaccaag 2908

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His His Pro Leu Asp Tyr Arg Ile Leu Leu Met Asp Glu Asp Gln Asp
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Arg Ile Tyr Val Gly Ser Lys Asp His Ile Leu Ser Leu Asn Ile Asn
65 70 75 80

Asn Ile Ser Gln Glu Ala Leu Ser Val Phe Trp Pro Ala Ser Thr Ile
85 90 95

Lys Val Glu Glu Cys Lys Met Ala Gly Lys Asp Pro Thr His Gly Cys
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Gly Asn Phe Val Arg Val Ile Gln Thr Phe Asn Arg Thr His Leu Tyr
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Val Cys Gly Ser Gly Ala Phe Ser Pro Val Cys Thr Tyr Leu Asn Arg
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Gly Arg Arg Ser Glu Asp Gln Val Phe Met Ile Asp Ser Lys Cys Glu
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Ser Gly Lys Gly Arg Cys Ser Phe Asn Pro Asn Val Asn Thr Val Ser
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Val Met Ile Asn Glu Glu Leu Phe Ser Gly Met Tyr Ile Asp Phe Met
            180                 185                 190

Gly Thr Asp Ala Ala Ile Phe Arg Ser Leu Thr Lys Arg Asn Ala Val
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Arg Thr Asp Gln His Asn Ser Lys Trp Leu Ser Glu Pro Met Phe Val
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Asp Ala His Val Ile Pro Asp Gly Thr Asp Pro Asn Asp Ala Lys Val
225                 230                 235                 240

Tyr Phe Phe Phe Lys Glu Lys Leu Thr Asp Asn Asn Arg Ser Thr Lys
                245                 250                 255

Gln Ile His Ser Met Ile Ala Arg Ile Cys Pro Asn Asp Thr Gly Gly
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Leu Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu
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Val Cys Ser Val Thr Asp Glu Asp Gly Pro Glu Thr His Phe Asp Glu
    290                 295                 300

Leu Glu Asp Val Phe Leu Leu Glu Thr Asp Asn Pro Arg Thr Thr Leu
305                 310                 315                 320

Val Tyr Gly Ile Phe Thr Thr Ser Ser Ser Val Phe Lys Gly Ser Ala
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Val Cys Val Tyr His Leu Ser Asp Ile Gln Thr Val Phe Asn Gly Pro
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Phe Ala His Lys Glu Gly Pro Asn His Gln Leu Ile Ser Tyr Gln Gly
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Arg Ile Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Ala Phe Thr
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Pro Asn Met Arg Thr Thr Lys Glu Phe Pro Asp Asp Val Val Thr Phe
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Arg Pro Leu Ile Val Arg Ile Gly Thr Asp Tyr Lys Tyr Thr Lys Ile
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Ala Val Asp Arg Val Asn Ala Ala Asp Gly Arg Tyr His Val Leu Phe
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Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Val Val Leu Pro Thr
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Asn Asn Ser Val Ser Gly Glu Leu Ile Leu Glu Glu Leu Glu Val Phe
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Lys Asn His Ala Pro Ile Thr Thr Met Lys Ile Ser Ser Lys Lys Gln
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Gln Leu Tyr Val Ser Ser Asn Glu Gly Val Ser Gln Val Ser Leu His
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Arg Cys His Ile Tyr Gly Thr Ala Cys Ala Asp Cys Cys Leu Ala Arg
515 520 525

Asp Pro Tyr Cys Ala Trp Asp Gly His Ser Cys Ser Arg Phe Tyr Pro
530 535 540

Thr Gly Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly Asn Pro
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565 570 575

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580 585 590

Ala Pro Lys Ser Pro Gln Ala Ser Ile Lys Trp Leu Leu Gln Lys Asp
595 600 605

Lys Asp Arg Arg Lys Glu Val Lys Leu Asn Glu Arg Ile Ile Ala Thr
610 615 620

Ser Gln Gly Leu Leu Ile Arg Ser Val Gln Gly Ser Asp Gln Gly Leu
625 630 635 640

Tyr His Cys Ile Ala Thr Glu Asn Ser Phe Lys Gln Thr Ile Ala Lys
645 650 655

Ile Asn Phe Lys Val Leu Asp Ser Glu Met Val Ala Val Val Thr Asp
660 665 670

Lys Trp Ser Pro Trp Thr Trp Ala Ser Ser Val Arg Ala Leu Pro Phe
675 680 685

His Pro Lys Asp Ile Met Gly Ala Phe Ser His Ser Glu Met Gln Met
690 695 700

Ile Asn Gln Tyr Cys Lys Asp Thr Arg Gln Gln His Gln Gln Gly Asp
705 710 715 720

Glu Ser Gln Lys Met Arg Gly Asp Tyr Gly Lys Leu Lys Ala Leu Ile
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cctccttaaa gtgaggagcg agggcttgga cggtgaacac ggcagc atg gca tcc 475
Met Ala Ser
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Ala Gly His Ile Ile Thr Leu Leu Leu Trp Gly Tyr Leu Leu Glu Leu
5 10 15

tgg aca gga ggt cat aca gct gat act acc cac ccc cgg tta cgc ctg 571
Trp Thr Gly Gly His Thr Ala Asp Thr Thr His Pro Arg Leu Arg Leu
20 25 30 35

tca cat aaa gag ctc ttg aat ctg aac aga aca tca ata ttt cat agc 619
Ser His Lys Glu Leu Leu Asn Leu Asn Arg Thr Ser Ile Phe His Ser
40 45 50

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cct ttt gga ttt ctt gat ctc cat aca atg ctg ctg gat gaa tat caa      667
Pro Phe Gly Phe Leu Asp Leu His Thr Met Leu Leu Asp Glu Tyr Gln
            55                  60                  65

gag agg ctc ttc gtg gga ggc agg gac ctt gta tat tcc ctc agc ttg      715
Glu Arg Leu Phe Val Gly Gly Arg Asp Leu Val Tyr Ser Leu Ser Leu
        70                  75                  80

gag aga atc agt gac ggc tat aaa gag ata cac tgg ccg agt aca gct      763
Glu Arg Ile Ser Asp Gly Tyr Lys Glu Ile His Trp Pro Ser Thr Ala
    85                  90                  95

cta aaa atg gaa gaa tgc ata atg aag gga aaa gat gcg ggt gaa tgt      811
Leu Lys Met Glu Glu Cys Ile Met Lys Gly Lys Asp Ala Gly Glu Cys
100                 105                 110                 115

gca aat tat gtt cgg gtt ttg cat cac tat aac agg aca cac ctt ctg      859
Ala Asn Tyr Val Arg Val Leu His His Tyr Asn Arg Thr His Leu Leu
                120                 125                 130

acc tgt ggt act gga gct ttt gat cca gtt tgt gcc ttc atc aga gtt      907
Thr Cys Gly Thr Gly Ala Phe Asp Pro Val Cys Ala Phe Ile Arg Val
            135                 140                 145

gga tat cat ttg gag gat cct ctg ttt cac ctg gaa tca ccc aga tct      955
Gly Tyr His Leu Glu Asp Pro Leu Phe His Leu Glu Ser Pro Arg Ser
        150                 155                 160

gag aga gga agg ggc aga tgt cct ttt gac ccc agc tcc tcc ttc atc     1003
Glu Arg Gly Arg Gly Arg Cys Pro Phe Asp Pro Ser Ser Ser Phe Ile
    165                 170                 175

tcc act tta att ggt agt gaa ttg ttt gct gga ctc tac agt gac tac     1051
Ser Thr Leu Ile Gly Ser Glu Leu Phe Ala Gly Leu Tyr Ser Asp Tyr
180                 185                 190                 195

tgg agc aga gac gct gcg atc ttc cgc agc atg ggg cga ctg gcc cat     1099
Trp Ser Arg Asp Ala Ala Ile Phe Arg Ser Met Gly Arg Leu Ala His
                200                 205                 210

atc cgc act gag cat gac gat gag cgt ctg ttg aaa gaa cca aaa ttt     1147
Ile Arg Thr Glu His Asp Asp Glu Arg Leu Leu Lys Glu Pro Lys Phe
            215                 220                 225

gta ggt tca tac atg att cct gac aat gaa gac aga gat gac aac aaa     1195
Val Gly Ser Tyr Met Ile Pro Asp Asn Glu Asp Arg Asp Asp Asn Lys
        230                 235                 240

gta tat ttc ttt ttt act gag aag gca ctg gag gca gaa aac aat gct     1243
Val Tyr Phe Phe Phe Thr Glu Lys Ala Leu Glu Ala Glu Asn Asn Ala
    245                 250                 255

cac gca att tac acc agg gtc ggg cga ctc tgt gtg aat gat gta gga     1291
His Ala Ile Tyr Thr Arg Val Gly Arg Leu Cys Val Asn Asp Val Gly
260                 265                 270                 275

ggg cag aga ata ctg gtg aat aag tgg agc act ttc cta aaa gcg aga     1339
Gly Gln Arg Ile Leu Val Asn Lys Trp Ser Thr Phe Leu Lys Ala Arg
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ctc gtt tgc tca gta cca gga atg aat gga att gac aca tat ttt gat     1387
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Leu Val Cys Ser Val Pro Gly Met Asn Gly Ile Asp Thr Tyr Phe Asp
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gaa tta gag gac gtt ttt ttg cta cct acc aga gat cat aag aat cca      1435
Glu Leu Glu Asp Val Phe Leu Leu Pro Thr Arg Asp His Lys Asn Pro
        310                 315                 320

gtg ata ttt gga ctc ttt aac act acc agt aat att ttt cga ggg cat      1483
Val Ile Phe Gly Leu Phe Asn Thr Thr Ser Asn Ile Phe Arg Gly His
    325                 330                 335

gct ata tgt gtc tat cac atg tct agc att cgg gca gcc ttc aac gga      1531
Ala Ile Cys Val Tyr His Met Ser Ser Ile Arg Ala Ala Phe Asn Gly
340                 345                 350                 355

cca tat gca cat aag gaa gga cct gaa tac cac tgg tca gtc tat gaa      1579
Pro Tyr Ala His Lys Glu Gly Pro Glu Tyr His Trp Ser Val Tyr Glu
                360                 365                 370

gga aaa gtc cct tat cca agg cct ggt tct tgt gcc agc aaa gta aat      1627
Gly Lys Val Pro Tyr Pro Arg Pro Gly Ser Cys Ala Ser Lys Val Asn
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gga ggg aga tac gga acc acc aag gac tat cct gat gat gcc atc cga      1675
Gly Gly Arg Tyr Gly Thr Thr Lys Asp Tyr Pro Asp Asp Ala Ile Arg
        390                 395                 400

ttt gca aga agt cat cca cta atg tac cag gcc ata aaa cct gcc cat      1723
Phe Ala Arg Ser His Pro Leu Met Tyr Gln Ala Ile Lys Pro Ala His
    405                 410                 415

aaa aaa cca ata ttg gta aaa aca gat gga aaa tat aac ctg aaa caa      1771
Lys Lys Pro Ile Leu Val Lys Thr Asp Gly Lys Tyr Asn Leu Lys Gln
420                 425                 430                 435

ata gca gta gat cga gtg gaa gct gag gat ggc caa tat gac gtc ttg      1819
Ile Ala Val Asp Arg Val Glu Ala Glu Asp Gly Gln Tyr Asp Val Leu
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ttt att ggg aca gat aat gga att gtg ctg aaa gta atc aca att tac      1867
Phe Ile Gly Thr Asp Asn Gly Ile Val Leu Lys Val Ile Thr Ile Tyr
            455                 460                 465

aac caa gaa atg gaa tca atg gaa gaa gta att cta gaa gaa ctt cag      1915
Asn Gln Glu Met Glu Ser Met Glu Glu Val Ile Leu Glu Glu Leu Gln
        470                 475                 480

ata ttc aag gat cca gtt cct att att tct atg gag att tct tca aaa      1963
Ile Phe Lys Asp Pro Val Pro Ile Ile Ser Met Glu Ile Ser Ser Lys
    485                 490                 495

cgg caa cag ctg tat att gga tct gct tct gct gtg gct caa gtc aga      2011
Arg Gln Gln Leu Tyr Ile Gly Ser Ala Ser Ala Val Ala Gln Val Arg
500                 505                 510                 515

ttc cat cac tgt gac atg tat gga agt gct tgt gct gac tgc tgc ctg      2059
Phe His His Cys Asp Met Tyr Gly Ser Ala Cys Ala Asp Cys Cys Leu
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gct cga gac cct tac tgt gcc tgg gat ggc ata tcc tgc tcc cgg tat      2107
Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ile Ser Cys Ser Arg Tyr
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tac cca aca ggc aca cat gca aaa agg cgt ttc cgg aga caa gat gtt      2155
Tyr Pro Thr Gly Thr His Ala Lys Arg Arg Phe Arg Arg Gln Asp Val
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cga cat gga aat gca gct cag cag tgc ttt gga caa cag ttt gtt ggg      2203
Arg His Gly Asn Ala Ala Gln Gln Cys Phe Gly Gln Gln Phe Val Gly
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gat gct ttg gat aag act gaa gaa cat ctg gct tat ggc ata gag aac      2251
Asp Ala Leu Asp Lys Thr Glu Glu His Leu Ala Tyr Gly Ile Glu Asn
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aac agt act ttg ctg gaa tgt acc cca cga tct tta caa gcg aaa gtt      2299
Asn Ser Thr Leu Leu Glu Cys Thr Pro Arg Ser Leu Gln Ala Lys Val
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atc tgg ttt gta cag aaa gga cgt gag aca aga aaa gag gag gtg aag      2347
Ile Trp Phe Val Gln Lys Gly Arg Glu Thr Arg Lys Glu Glu Val Lys
            615                 620                 625

aca gat gac aga gtg gtt aag atg gac ctt ggt tta ctc ttc cta agg      2395
Thr Asp Asp Arg Val Val Lys Met Asp Leu Gly Leu Leu Phe Leu Arg
        630                 635                 640

tta cac aaa tca gat gct ggg acc tat ttt tgc cag aca gta gag cat      2443
Leu His Lys Ser Asp Ala Gly Thr Tyr Phe Cys Gln Thr Val Glu His
    645                 650                 655

agc ttt gtc cat acg gtc cgt aaa atc acc ttg gag gta gtg gaa gag      2491
Ser Phe Val His Thr Val Arg Lys Ile Thr Leu Glu Val Val Glu Glu
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gag aaa gtc gag gat atg ttt aac aag gac gat gag gag gac agg cat      2539
Glu Lys Val Glu Asp Met Phe Asn Lys Asp Asp Glu Glu Asp Arg His
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cac agg atg cct tgt cct gct cag agt agc atc tcg cag gga gca aaa      2587
His Arg Met Pro Cys Pro Ala Gln Ser Ser Ile Ser Gln Gly Ala Lys
            695                 700                 705

cca tgg tac aag gaa ttc ttg cag ctg atc ggt tat agc aac ttc cag      2635
Pro Trp Tyr Lys Glu Phe Leu Gln Leu Ile Gly Tyr Ser Asn Phe Gln
        710                 715                 720

aga gtg gaa gaa tac tgc gag aaa gta tgg tgc aca gat aga aag agg      2683
Arg Val Glu Glu Tyr Cys Glu Lys Val Trp Cys Thr Asp Arg Lys Arg
    725                 730                 735

aaa aag ctt aaa atg tca ccc tcc aag tgg aag tat gcc aac cct cag      2731
Lys Lys Leu Lys Met Ser Pro Ser Lys Trp Lys Tyr Ala Asn Pro Gln
740                 745                 750                 755

gaa aag aag ctc cgt tcc aaa cct gag cat tac cgc ctg ccc agg cac      2779
Glu Lys Lys Leu Arg Ser Lys Pro Glu His Tyr Arg Leu Pro Arg His
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acg ctg gac tcc tga tggggtgaga ctatctactg tcttttgaag aatttatatt      2834
Thr Leu Asp Ser
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Leu Arg Leu Ser His Lys Glu Leu Leu Asn Leu Asn Arg Thr Ser Ile
        35                  40                  45

Phe His Ser Pro Phe Gly Phe Leu Asp Leu His Thr Met Leu Leu Asp
    50                  55                  60

Glu Tyr Gln Glu Arg Leu Phe Val Gly Gly Arg Asp Leu Val Tyr Ser
65                  70                  75                  80

Leu Ser Leu Glu Arg Ile Ser Asp Gly Tyr Lys Glu Ile His Trp Pro
                85                  90                  95

Ser Thr Ala Leu Lys Met Glu Glu Cys Ile Met Lys Gly Lys Asp Ala
            100                 105                 110

Gly Glu Cys Ala Asn Tyr Val Arg Val Leu His His Tyr Asn Arg Thr
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His Leu Leu Thr Cys Gly Thr Gly Ala Phe Asp Pro Val Cys Ala Phe
    130                 135                 140

Ile Arg Val Gly Tyr His Leu Glu Asp Pro Leu Phe His Leu Glu Ser
145                 150                 155                 160

Pro Arg Ser Glu Arg Gly Arg Gly Arg Cys Pro Phe Asp Pro Ser Ser
                165                 170                 175

Ser Phe Ile Ser Thr Leu Ile Gly Ser Glu Leu Phe Ala Gly Leu Tyr
            180                 185                 190

Ser Asp Tyr Trp Ser Arg Asp Ala Ala Ile Phe Arg Ser Met Gly Arg
        195                 200                 205

Leu Ala His Ile Arg Thr Glu His Asp Asp Glu Arg Leu Leu Lys Glu
    210                 215                 220

Pro Lys Phe Val Gly Ser Tyr Met Ile Pro Asp Asn Glu Asp Arg Asp
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Asp Asn Lys Val Tyr Phe Phe Phe Thr Glu Lys Ala Leu Glu Ala Glu
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Asn Asn Ala His Ala Ile Tyr Thr Arg Val Gly Arg Leu Cys Val Asn
            260                 265                 270

Asp Val Gly Gly Gln Arg Ile Leu Val Asn Lys Trp Ser Thr Phe Leu
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Lys Ala Arg Leu Val Cys Ser Val Pro Gly Met Asn Gly Ile Asp Thr
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Tyr Phe Asp Glu Leu Glu Asp Val Phe Leu Leu Pro Thr Arg Asp His
305                 310                 315                 320

Lys Asn Pro Val Ile Phe Gly Leu Phe Asn Thr Thr Ser Asn Ile Phe
                325                 330                 335

Arg Gly His Ala Ile Cys Val Tyr His Met Ser Ser Ile Arg Ala Ala
            340                 345                 350

Phe Asn Gly Pro Tyr Ala His Lys Glu Gly Pro Glu Tyr His Trp Ser
        355                 360                 365

Val Tyr Glu Gly Lys Val Pro Tyr Pro Arg Pro Gly Ser Cys Ala Ser
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Lys Val Asn Gly Gly Arg Tyr Gly Thr Thr Lys Asp Tyr Pro Asp Asp
385                 390                 395                 400

Ala Ile Arg Phe Ala Arg Ser His Pro Leu Met Tyr Gln Ala Ile Lys
                405                 410                 415

Pro Ala His Lys Lys Pro Ile Leu Val Lys Thr Asp Gly Lys Tyr Asn
            420                 425                 430

Leu Lys Gln Ile Ala Val Asp Arg Val Glu Ala Glu Asp Gly Gln Tyr
        435                 440                 445

Asp Val Leu Phe Ile Gly Thr Asp Asn Gly Ile Val Leu Lys Val Ile
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Thr Ile Tyr Asn Gln Glu Met Glu Ser Met Glu Glu Val Ile Leu Glu
465                 470                 475                 480

Glu Leu Gln Ile Phe Lys Asp Pro Val Pro Ile Ile Ser Met Glu Ile
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Ser Ser Lys Arg Gln Gln Leu Tyr Ile Gly Ser Ala Ser Ala Val Ala
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Gln Val Arg Phe His His Cys Asp Met Tyr Gly Ser Ala Cys Ala Asp
515 520 525

Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ile Ser Cys
530 535 540

Ser Arg Tyr Tyr Pro Thr Gly Thr His Ala Lys Arg Arg Phe Arg Arg
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Gln Asp Val Arg His Gly Asn Ala Ala Gln Gln Cys Phe Gly Gln Gln
565 570 575

Phe Val Gly Asp Ala Leu Asp Lys Thr Glu Glu His Leu Ala Tyr Gly
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Ile Glu Asn Asn Ser Thr Leu Leu Glu Cys Thr Pro Arg Ser Leu Gln
595 600 605

Ala Lys Val Ile Trp Phe Val Gln Lys Gly Arg Glu Thr Arg Lys Glu
610 615 620

Glu Val Lys Thr Asp Asp Arg Val Val Lys Met Asp Leu Gly Leu Leu
625 630 635 640

Phe Leu Arg Leu His Lys Ser Asp Ala Gly Thr Tyr Phe Cys Gln Thr
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Val Glu His Ser Phe Val His Thr Val Arg Lys Ile Thr Leu Glu Val
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Val Glu Glu Glu Lys Val Glu Asp Met Phe Asn Lys Asp Asp Glu Glu
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Asp Arg His His Arg Met Pro Cys Pro Ala Gln Ser Ser Ile Ser Gln
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Gly Ala Lys Pro Trp Tyr Lys Glu Phe Leu Gln Leu Ile Gly Tyr Ser
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Asn Phe Gln Arg Val Glu Glu Tyr Cys Glu Lys Val Trp Cys Thr Asp
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Arg Lys Arg Lys Lys Leu Lys Met Ser Pro Ser Lys Trp Lys Tyr Ala
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                       Met Leu Val Ala Gly Leu Leu Leu Trp Ala Ser
                       1               5                   10

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Leu Leu Thr Gly Ala Trp Pro Ser Phe Pro Thr Gln Asp His Leu Pro
            15                  20                  25

gcc acg ccc cgg gtc cgg ctc tca ttc aaa gag ctg aag gcc aca ggc      207
Ala Thr Pro Arg Val Arg Leu Ser Phe Lys Glu Leu Lys Ala Thr Gly
        30                  35                  40

acc gcc cac ttc ttc aac ttc ctg ctc aac aca acc gac tac cga atc      255
Thr Ala His Phe Phe Asn Phe Leu Leu Asn Thr Thr Asp Tyr Arg Ile
    45                  50                  55

ttg ctc aag gac gag gac cac gac cgc atg tac gtg ggc agc aag gac      303
Leu Leu Lys Asp Glu Asp His Asp Arg Met Tyr Val Gly Ser Lys Asp
60                  65                  70                  75

tac gtg ctg tcc ctg gac ctg cac gac atc aac cgc gag ccc ctc att      351
Tyr Val Leu Ser Leu Asp Leu His Asp Ile Asn Arg Glu Pro Leu Ile
                80                  85                  90

ata cac tgg gca gcc tcc cca cag cgc atc gag gaa tgc gtg ctc tca      399
Ile His Trp Ala Ala Ser Pro Gln Arg Ile Glu Glu Cys Val Leu Ser
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ggc aag gat gtc aac ggc gag tgt ggg aac ttc gtc agg ctc atc cag      447
Gly Lys Asp Val Asn Gly Glu Cys Gly Asn Phe Val Arg Leu Ile Gln
        110                 115                 120

ccc tgg aac cga aca cac ctg tat gtg tgc ggg aca ggt gcc tac aac      495
Pro Trp Asn Arg Thr His Leu Tyr Val Cys Gly Thr Gly Ala Tyr Asn
    125                 130                 135

ccc atg tgc acc tat gtg aac cgc gga cgc cgc gcc cag gcc aca cca      543
Pro Met Cys Thr Tyr Val Asn Arg Gly Arg Arg Ala Gln Ala Thr Pro
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tgg acc cag act cag gcg gtc aga ggc cgc ggc agc aga gcc acg gat      591
Trp Thr Gln Thr Gln Ala Val Arg Gly Arg Gly Ser Arg Ala Thr Asp
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ggt gcc ctc cgc ccg atg ccc aca gcc cca cgc cag gat tac atc ttc      639
Gly Ala Leu Arg Pro Met Pro Thr Ala Pro Arg Gln Asp Tyr Ile Phe
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Tyr Leu Glu Pro Glu Arg Leu Glu Ser Gly Lys Gly Lys Cys Pro Tyr
        190                 195                 200

gat ccc aag ctg gac aca gca tcg gcc ctc atc aat gag gag ctc tat      735
Asp Pro Lys Leu Asp Thr Ala Ser Ala Leu Ile Asn Glu Glu Leu Tyr
    205                 210                 215

gct ggt gtg tac atc gat ttt atg ggc act gat gca gcc atc ttc cgc      783
Ala Gly Val Tyr Ile Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg
220                 225                 230                 235

aca ctt gga aag cag aca gcc atg cgc acg gat cag tac aac tcc cgg      831
Thr Leu Gly Lys Gln Thr Ala Met Arg Thr Asp Gln Tyr Asn Ser Arg
                240                 245                 250

tgg ctg aac gac ccg tcg ttc atc cat gct gag ctc att cct gac agt      879
Trp Leu Asn Asp Pro Ser Phe Ile His Ala Glu Leu Ile Pro Asp Ser
            255                 260                 265

gcg gag cgc aat gat gat aag ctt tac ttc ttc ttc cgt gag cgg tcg      927
Ala Glu Arg Asn Asp Asp Lys Leu Tyr Phe Phe Phe Arg Glu Arg Ser
        270                 275                 280

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Ala Glu Ala Pro Gln Ser Pro Ala Val Tyr Ala Arg Ile Gly Arg Ile
    285                 290                 295

tgc ctg aac gat gac ggt ggt cac tgt tgc ctg gtc aac aag tgg agc     1023
Cys Leu Asn Asp Asp Gly Gly His Cys Cys Leu Val Asn Lys Trp Ser
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Thr Phe Leu Lys Ala Arg Leu Val Cys Ser Val Pro Gly Glu Asp Gly
                320                 325                 330

att gag act cac ttt gat gag ctc cag gac gtg ttt gtc cag cag acc     1119
Ile Glu Thr His Phe Asp Glu Leu Gln Asp Val Phe Val Gln Gln Thr
            335                 340                 345

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Gln Asp Val Arg Asn Pro Val Ile Tyr Ala Val Phe Thr Ser Ser Gly
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Ser Val Phe Arg Gly Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile
    365                 370                 375

cgc atg gtc ttc aac ggg ccc ttt gcc cac aaa gag ggg ccc aac tac     1263
Arg Met Val Phe Asn Gly Pro Phe Ala His Lys Glu Gly Pro Asn Tyr
380                 385                 390                 395

cag tgg atg ccc ttc tca ggg aag atg ccc tac cca cgg ccg ggc acg     1311
Gln Trp Met Pro Phe Ser Gly Lys Met Pro Tyr Pro Arg Pro Gly Thr
                400                 405                 410

tgc cct ggt gga acc ttc acg cca tct atg aag tcc acc aag gat tat     1359
Cys Pro Gly Gly Thr Phe Thr Pro Ser Met Lys Ser Thr Lys Asp Tyr
            415                 420                 425

cct gat gag gtg atc aac ttc atg cgc agc cac cca ctc atg tac cag     1407
Pro Asp Glu Val Ile Asn Phe Met Arg Ser His Pro Leu Met Tyr Gln
        430                 435                 440
```

```
gcc gtg tac cct ctg cag cgg cgg ccc ctg gta gtc cgc aca ggt gct      1455
Ala Val Tyr Pro Leu Gln Arg Arg Pro Leu Val Val Arg Thr Gly Ala
    445                 450                 455

ccc tac cgc ctt acc act att gcc gtg gac cag gtg gat gca ggc gac      1503
Pro Tyr Arg Leu Thr Thr Ile Ala Val Asp Gln Val Asp Ala Gly Asp
460                 465                 470                 475

ggg cgc tat gag gtg ctt ttc ctg ggc aca gac cgc ggg aca gtg cag      1551
Gly Arg Tyr Glu Val Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln
                480                 485                 490

aag gtc att gtg ctg ccc aag gat gac cag gag atg gag gag ctc atg      1599
Lys Val Ile Val Leu Pro Lys Asp Asp Gln Glu Met Glu Glu Leu Met
            495                 500                 505

ctg gag gag gtg gag gtc ttc aag gat cca gca ccc gtc aag acc atg      1647
Leu Glu Glu Val Glu Val Phe Lys Asp Pro Ala Pro Val Lys Thr Met
        510                 515                 520

acc atc tct tct aag agg caa caa ctc tac gtg gcg tca gcc gtg ggt      1695
Thr Ile Ser Ser Lys Arg Gln Gln Leu Tyr Val Ala Ser Ala Val Gly
    525                 530                 535

gtc aca cac ctg agc ctg cac cgc tgc cag gcg tat ggg gct gcc tgt      1743
Val Thr His Leu Ser Leu His Arg Cys Gln Ala Tyr Gly Ala Ala Cys
540                 545                 550                 555

gct gac tgc tgc ctt gcc cgg gac cct tac tgt gcc tgg gat ggc cag      1791
Ala Asp Cys Cys Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Gln
                560                 565                 570

gcc tgc tcc cgc tat aca gca tcc tcc aag agg cgg agc cgc cgg cag      1839
Ala Cys Ser Arg Tyr Thr Ala Ser Ser Lys Arg Arg Ser Arg Arg Gln
            575                 580                 585

gac gtc cgg cac gga aac ccc atc agg cag tgc cgt ggg ttc aac tcc      1887
Asp Val Arg His Gly Asn Pro Ile Arg Gln Cys Arg Gly Phe Asn Ser
        590                 595                 600

aat gcc aac aag aat gcc gtg gag tct gtg cag tat ggc gtg gcc ggc      1935
Asn Ala Asn Lys Asn Ala Val Glu Ser Val Gln Tyr Gly Val Ala Gly
    605                 610                 615

agc gca gcc ttc ctt gag tgc cag ccc cgc tcg ccc caa gcc act gtt      1983
Ser Ala Ala Phe Leu Glu Cys Gln Pro Arg Ser Pro Gln Ala Thr Val
620                 625                 630                 635

aag tgg ctg ttc cag cga gat cct ggt gac cgg cgc cga gag att cgt      2031
Lys Trp Leu Phe Gln Arg Asp Pro Gly Asp Arg Arg Arg Glu Ile Arg
                640                 645                 650

gca gag gac cgc ttc ctg cgc aca gag cag ggc ttg ttg ctc cgt gca      2079
Ala Glu Asp Arg Phe Leu Arg Thr Glu Gln Gly Leu Leu Leu Arg Ala
            655                 660                 665

ctg cag ctc agc gat cgt ggc ctc tac tcc tgc aca gcc act gag aac      2127
Leu Gln Leu Ser Asp Arg Gly Leu Tyr Ser Cys Thr Ala Thr Glu Asn
        670                 675                 680

aac ttt aag cac gtc gtc aca cga gtg cag ctg cat gta ctg ggc cgg      2175
Asn Phe Lys His Val Val Thr Arg Val Gln Leu His Val Leu Gly Arg
    685                 690                 695
```

```
gac gcc gtc cat gct gcc ctc ttc cca cca ctg tcc atg agc gcc ccg     2223
Asp Ala Val His Ala Ala Leu Phe Pro Pro Leu Ser Met Ser Ala Pro
700                 705                 710                 715

cca ccc cca ggc gca ggc ccc cca acg cct cct tac cag gag tta gcc     2271
Pro Pro Pro Gly Ala Gly Pro Pro Thr Pro Pro Tyr Gln Glu Leu Ala
                720                 725                 730

cag ctg ctg gcc cag cca gaa gtg ggc ctc atc cac cag tac tgc cag     2319
Gln Leu Leu Ala Gln Pro Glu Val Gly Leu Ile His Gln Tyr Cys Gln
            735                 740                 745

ggt tac tgg cgc cat gtg ccc ccc agc ccc agg gag gct cca ggg gca     2367
Gly Tyr Trp Arg His Val Pro Pro Ser Pro Arg Glu Ala Pro Gly Ala
        750                 755                 760

ccc cgg tct cct gag ccc cag gac cag aaa aag ccc cgg aac cgc cgg     2415
Pro Arg Ser Pro Glu Pro Gln Asp Gln Lys Lys Pro Arg Asn Arg Arg
    765                 770                 775

cac cac cct ccg gac aca tga ggccagctgc ctgtgcctgc catgggccag       2466
His His Pro Pro Asp Thr
780                 785

gctaggcctt ggtccctttt aatataaaag atatatatat atatatatat atatattaaa  2526

atatcggggt ggggggtgat tggaagggag ggaggtggcc ttcccaatgc gcgttattcg  2586

gggttattga agaataatat tgcaagtgac agccagaagt agactttctg tcctcacacc  2646

gaagaacccg agtgagcagg agggagggag agacgcgaag agacctttt tccttttggg  2706

agaccttgtc cgc                                                     2719
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<210> 18
<211> 785
<212> PRT
<213> Homo sapiens

<400> 18

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Met Leu Val Ala Gly Leu Leu Leu Trp Ala Ser Leu Leu Thr Gly Ala
1               5                   10                  15

Trp Pro Ser Phe Pro Thr Gln Asp His Leu Pro Ala Thr Pro Arg Val
            20                  25                  30

Arg Leu Ser Phe Lys Glu Leu Lys Ala Thr Gly Thr Ala His Phe Phe
        35                  40                  45

Asn Phe Leu Leu Asn Thr Thr Asp Tyr Arg Ile Leu Leu Lys Asp Glu
    50                  55                  60

Asp His Asp Arg Met Tyr Val Gly Ser Lys Asp Tyr Val Leu Ser Leu
65                  70                  75                  80
```

```
Asp Leu His Asp Ile Asn Arg Glu Pro Leu Ile Ile His Trp Ala Ala
                85                  90                  95

Ser Pro Gln Arg Ile Glu Glu Cys Val Leu Ser Gly Lys Asp Val Asn
            100                 105                 110

Gly Glu Cys Gly Asn Phe Val Arg Leu Ile Gln Pro Trp Asn Arg Thr
        115                 120                 125

His Leu Tyr Val Cys Gly Thr Gly Ala Tyr Asn Pro Met Cys Thr Tyr
    130                 135                 140

Val Asn Arg Gly Arg Arg Ala Gln Ala Thr Pro Trp Thr Gln Thr Gln
145                 150                 155                 160

Ala Val Arg Gly Arg Gly Ser Arg Ala Thr Asp Gly Ala Leu Arg Pro
                165                 170                 175

Met Pro Thr Ala Pro Arg Gln Asp Tyr Ile Phe Tyr Leu Glu Pro Glu
            180                 185                 190

Arg Leu Glu Ser Gly Lys Gly Lys Cys Pro Tyr Asp Pro Lys Leu Asp
        195                 200                 205

Thr Ala Ser Ala Leu Ile Asn Glu Glu Leu Tyr Ala Gly Val Tyr Ile
    210                 215                 220

Asp Phe Met Gly Thr Asp Ala Ala Ile Phe Arg Thr Leu Gly Lys Gln
225                 230                 235                 240

Thr Ala Met Arg Thr Asp Gln Tyr Asn Ser Arg Trp Leu Asn Asp Pro
                245                 250                 255

Ser Phe Ile His Ala Glu Leu Ile Pro Asp Ser Ala Glu Arg Asn Asp
            260                 265                 270

Asp Lys Leu Tyr Phe Phe Phe Arg Glu Arg Ser Ala Glu Ala Pro Gln
        275                 280                 285

Ser Pro Ala Val Tyr Ala Arg Ile Gly Arg Ile Cys Leu Asn Asp Asp
    290                 295                 300

Gly Gly His Cys Cys Leu Val Asn Lys Trp Ser Thr Phe Leu Lys Ala
305                 310                 315                 320

Arg Leu Val Cys Ser Val Pro Gly Glu Asp Gly Ile Glu Thr His Phe
                325                 330                 335
```

```
Asp Glu Leu Gln Asp Val Phe Val Gln Gln Thr Gln Asp Val Arg Asn
            340                 345                 350

Pro Val Ile Tyr Ala Val Phe Thr Ser Ser Gly Ser Val Phe Arg Gly
        355                 360                 365

Ser Ala Val Cys Val Tyr Ser Met Ala Asp Ile Arg Met Val Phe Asn
    370                 375                 380

Gly Pro Phe Ala His Lys Glu Gly Pro Asn Tyr Gln Trp Met Pro Phe
385                 390                 395                 400

Ser Gly Lys Met Pro Tyr Pro Arg Pro Gly Thr Cys Pro Gly Gly Thr
                405                 410                 415

Phe Thr Pro Ser Met Lys Ser Thr Lys Asp Tyr Pro Asp Glu Val Ile
            420                 425                 430

Asn Phe Met Arg Ser His Pro Leu Met Tyr Gln Ala Val Tyr Pro Leu
        435                 440                 445

Gln Arg Arg Pro Leu Val Val Arg Thr Gly Ala Pro Tyr Arg Leu Thr
    450                 455                 460

Thr Ile Ala Val Asp Gln Val Asp Ala Gly Asp Gly Arg Tyr Glu Val
465                 470                 475                 480

Leu Phe Leu Gly Thr Asp Arg Gly Thr Val Gln Lys Val Ile Val Leu
                485                 490                 495

Pro Lys Asp Asp Gln Glu Met Glu Glu Leu Met Leu Glu Glu Val Glu
            500                 505                 510

Val Phe Lys Asp Pro Ala Pro Val Lys Thr Met Thr Ile Ser Ser Lys
        515                 520                 525

Arg Gln Gln Leu Tyr Val Ala Ser Ala Val Gly Val Thr His Leu Ser
    530                 535                 540

Leu His Arg Cys Gln Ala Tyr Gly Ala Ala Cys Ala Asp Cys Cys Leu
545                 550                 555                 560

Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Gln Ala Cys Ser Arg Tyr
                565                 570                 575

Thr Ala Ser Ser Lys Arg Arg Ser Arg Arg Gln Asp Val Arg His Gly
            580                 585                 590
```

```
Asn Pro Ile Arg Gln Cys Arg Gly Phe Asn Ser Asn Ala Asn Lys Asn
        595                 600                 605

Ala Val Glu Ser Val Gln Tyr Gly Val Ala Gly Ser Ala Ala Phe Leu
    610                 615                 620

Glu Cys Gln Pro Arg Ser Pro Gln Ala Thr Val Lys Trp Leu Phe Gln
625                 630                 635                 640

Arg Asp Pro Gly Asp Arg Arg Arg Glu Ile Arg Ala Glu Asp Arg Phe
                645                 650                 655

Leu Arg Thr Glu Gln Gly Leu Leu Leu Arg Ala Leu Gln Leu Ser Asp
            660                 665                 670

Arg Gly Leu Tyr Ser Cys Thr Ala Thr Glu Asn Asn Phe Lys His Val
        675                 680                 685

Val Thr Arg Val Gln Leu His Val Leu Gly Arg Asp Ala Val His Ala
    690                 695                 700

Ala Leu Phe Pro Pro Leu Ser Met Ser Ala Pro Pro Pro Pro Gly Ala
705                 710                 715                 720

Gly Pro Pro Thr Pro Pro Tyr Gln Glu Leu Ala Gln Leu Leu Ala Gln
                725                 730                 735

Pro Glu Val Gly Leu Ile His Gln Tyr Cys Gln Gly Tyr Trp Arg His
            740                 745                 750

Val Pro Pro Ser Pro Arg Glu Ala Pro Gly Ala Pro Arg Ser Pro Glu
        755                 760                 765

Pro Gln Asp Gln Lys Lys Pro Arg Asn Arg Arg His His Pro Pro Asp
    770                 775                 780

Thr
785
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<210> 19
<211> 649
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (17)..(592)

<220>
<221> misc_feature
<222> (17)..(94)
<223> Signal peptide

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tcgggcctcc gaaacc atg aac ttt ctg ctg tct tgg gtg cat tgg agc ctt 52
Met Asn Phe Leu Leu Ser Trp Val His Trp Ser Leu
1 5 10

gcc ttg ctg ctc tac ctc cac cat gcc aag tgg tcc cag gct gca ccc 100
Ala Leu Leu Leu Tyr Leu His His Ala Lys Trp Ser Gln Ala Ala Pro
15 20 25

atg gca gaa gga gga ggg cag aat cat cac gaa gtg gtg aag ttc atg 148
Met Ala Glu Gly Gly Gly Gln Asn His His Glu Val Val Lys Phe Met
30 35 40

gat gtc tat cag cgc agc tac tgc cat cca atc gag acc ctg gtg gac 196
Asp Val Tyr Gln Arg Ser Tyr Cys His Pro Ile Glu Thr Leu Val Asp
45 50 55 60

atc ttc cag gag tac cct gat gag atc gag tac atc ttc aag cca tcc 244
Ile Phe Gln Glu Tyr Pro Asp Glu Ile Glu Tyr Ile Phe Lys Pro Ser
65 70 75

tgt gtg ccc ctg atg cga tgc ggg ggc tgc tgc aat gac gag ggc ctg 292
Cys Val Pro Leu Met Arg Cys Gly Gly Cys Cys Asn Asp Glu Gly Leu
80 85 90

gag tgt gtg ccc act gag gag tcc aac atc acc atg cag att atg cgg 340
Glu Cys Val Pro Thr Glu Glu Ser Asn Ile Thr Met Gln Ile Met Arg
95 100 105

atc aaa cct cac caa ggc cag cac ata gga gag atg agc ttc cta cag 388
Ile Lys Pro His Gln Gly Gln His Ile Gly Glu Met Ser Phe Leu Gln
110 115 120

cac aac aaa tgt gaa tgc aga cca aag aaa gat aga gca aga caa gaa 436
His Asn Lys Cys Glu Cys Arg Pro Lys Lys Asp Arg Ala Arg Gln Glu
125 130 135 140

aat ccc tgt ggg cct tgc tca gag cgg aga aag cat ttg ttt gta caa 484
Asn Pro Cys Gly Pro Cys Ser Glu Arg Arg Lys His Leu Phe Val Gln
145 150 155

gat ccg cag acg tgt aaa tgt tcc tgc aaa aac aca gac tcg cgt tgc 532
Asp Pro Gln Thr Cys Lys Cys Ser Cys Lys Asn Thr Asp Ser Arg Cys
160 165 170

aag gcg agg cag ctt gag tta aac gaa cgt act tgc aga tgt gac aag 580
Lys Ala Arg Gln Leu Glu Leu Asn Glu Arg Thr Cys Arg Cys Asp Lys
175 180 185

ccg agg cgg tga gccgggcagg aggaaggagc ctccctcagc gtttcgggaa 632
Pro Arg Arg
190

ccagatctct caccagg 649

<210> 20
<211> 191
<212> PRT
<213> Homo sapiens

<220>
<221> misc_feature
<222> (17)..(94)
<223> Signal peptide

<400> 20

Met Asn Phe Leu Leu Ser Trp Val His Trp Ser Leu Ala Leu Leu Leu
1 5 10 15

Tyr Leu His His Ala Lys Trp Ser Gln Ala Ala Pro Met Ala Glu Gly
20 25 30

Gly Gly Gln Asn His His Glu Val Val Lys Phe Met Asp Val Tyr Gln
35 40 45

Arg Ser Tyr Cys His Pro Ile Glu Thr Leu Val Asp Ile Phe Gln Glu
50 55 60

Tyr Pro Asp Glu Ile Glu Tyr Ile Phe Lys Pro Ser Cys Val Pro Leu
65 70 75 80

Met Arg Cys Gly Gly Cys Cys Asn Asp Glu Gly Leu Glu Cys Val Pro
85 90 95

Thr Glu Glu Ser Asn Ile Thr Met Gln Ile Met Arg Ile Lys Pro His
100 105 110

Gln Gly Gln His Ile Gly Glu Met Ser Phe Leu Gln His Asn Lys Cys
115 120 125

Glu Cys Arg Pro Lys Lys Asp Arg Ala Arg Gln Glu Asn Pro Cys Gly
130 135 140

Pro Cys Ser Glu Arg Arg Lys His Leu Phe Val Gln Asp Pro Gln Thr
145 150 155 160

Cys Lys Cys Ser Cys Lys Asn Thr Asp Ser Arg Cys Lys Ala Arg Gln
165 170 175

Leu Glu Leu Asn Glu Arg Thr Cys Arg Cys Asp Lys Pro Arg Arg
180 185 190

<210> 21
<211> 755
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (5)..(628)

<400> 21

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cacc atg agc cct ctg ctc cgc cgc ctg ctg ctc gcc gca ctc ctg cag      49
     Met Ser Pro Leu Leu Arg Arg Leu Leu Leu Ala Ala Leu Leu Gln
     1               5                   10                  15

ctg gcc ccc gcc cag gcc cct gtc tcc cag cct gat gcc cct ggc cac      97
Leu Ala Pro Ala Gln Ala Pro Val Ser Gln Pro Asp Ala Pro Gly His
                20                  25                  30

cag agg aaa gtg gtg tca tgg ata gat gtg tat act cgc gct acc tgc     145
Gln Arg Lys Val Val Ser Trp Ile Asp Val Tyr Thr Arg Ala Thr Cys
            35                  40                  45

cag ccc cgg gag gtg gtg gtg ccc ttg act gtg gag ctc atg ggc acc     193
Gln Pro Arg Glu Val Val Val Pro Leu Thr Val Glu Leu Met Gly Thr
        50                  55                  60

gtg gcc aaa cag ctg gtg ccc agc tgc gtg act gtg cag cgc tgt ggt     241
Val Ala Lys Gln Leu Val Pro Ser Cys Val Thr Val Gln Arg Cys Gly
    65                  70                  75

ggc tgc tgc cct gac gat ggc ctg gag tgt gtg ccc act ggg cag cac     289
Gly Cys Cys Pro Asp Asp Gly Leu Glu Cys Val Pro Thr Gly Gln His
80                  85                  90                  95

caa gtc cgg atg cag atc ctc atg atc cgg tac ccg agc agt cag ctg     337
Gln Val Arg Met Gln Ile Leu Met Ile Arg Tyr Pro Ser Ser Gln Leu
                100                 105                 110

ggg gag atg tcc ctg gaa gaa cac agc cag tgt gaa tgc aga cct aaa     385
Gly Glu Met Ser Leu Glu Glu His Ser Gln Cys Glu Cys Arg Pro Lys
            115                 120                 125

aaa aag gac agt gct gtg aag cca gac agg gct gcc act ccc cac cac     433
Lys Lys Asp Ser Ala Val Lys Pro Asp Arg Ala Ala Thr Pro His His
        130                 135                 140

cgt ccc cag ccc cgt tct gtt ccg ggc tgg gac tct gcc ccc gga gca     481
Arg Pro Gln Pro Arg Ser Val Pro Gly Trp Asp Ser Ala Pro Gly Ala
    145                 150                 155

ccc tcc cca gct gac atc acc cat ccc act cca gcc cca ggc ccc tct     529
Pro Ser Pro Ala Asp Ile Thr His Pro Thr Pro Ala Pro Gly Pro Ser
160                 165                 170                 175

gcc cac gct gca ccc agc acc acc agc gcc ctg acc ccc gga cct gcc     577
Ala His Ala Ala Pro Ser Thr Thr Ser Ala Leu Thr Pro Gly Pro Ala
                180                 185                 190

gcc gcc gct gcc gac gcc gca gct tcc tcc gtt gcc aag ggc ggg gct     625
Ala Ala Ala Ala Asp Ala Ala Ala Ser Ser Val Ala Lys Gly Gly Ala
            195                 200                 205

tag agctcaaccc agacacctgc aggtgccgga agctgcgaag gtgacacatg          678

gcttttcaga ctcagcaggg tgacttgcct cagaggctat atcccagtgg gggaacaaag   738
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aggagcctgg taaaaaa 755

<210> 22
<211> 207
<212> PRT
<213> Homo sapiens

<400> 22

Met Ser Pro Leu Leu Arg Arg Leu Leu Leu Ala Ala Leu Leu Gln Leu
1 5 10 15

Ala Pro Ala Gln Ala Pro Val Ser Gln Pro Asp Ala Pro Gly His Gln
20 25 30

Arg Lys Val Val Ser Trp Ile Asp Val Tyr Thr Arg Ala Thr Cys Gln
35 40 45

Pro Arg Glu Val Val Val Pro Leu Thr Val Glu Leu Met Gly Thr Val
50 55 60

Ala Lys Gln Leu Val Pro Ser Cys Val Thr Val Gln Arg Cys Gly Gly
65 70 75 80

Cys Cys Pro Asp Asp Gly Leu Glu Cys Val Pro Thr Gly Gln His Gln
85 90 95

Val Arg Met Gln Ile Leu Met Ile Arg Tyr Pro Ser Ser Gln Leu Gly
100 105 110

Glu Met Ser Leu Glu Glu His Ser Gln Cys Glu Cys Arg Pro Lys Lys
115 120 125

Lys Asp Ser Ala Val Lys Pro Asp Arg Ala Ala Thr Pro His His Arg
130 135 140

Pro Gln Pro Arg Ser Val Pro Gly Trp Asp Ser Ala Pro Gly Ala Pro
145 150 155 160

Ser Pro Ala Asp Ile Thr His Pro Thr Pro Ala Pro Gly Pro Ser Ala
165 170 175

His Ala Ala Pro Ser Thr Thr Ser Ala Leu Thr Pro Gly Pro Ala Ala
180 185 190

Ala Ala Ala Asp Ala Ala Ala Ser Ser Val Ala Lys Gly Gly Ala
195 200 205

<210> 23
<211> 1997
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (352)..(1611)

<400> 23
cccgccccgc ctctccaaaa agctacaccg acgcggaccg cggcggcgtc ctccctcgcc 60

ctcgcttcac ctcgcgggct ccgaatgcgg ggagctcgga tgtccggttt cctgtgaggc 120

ttttacctga cacccgccgc ctttccccgg cactggctgg gagggcgccc tgcaaagttg 180

ggaacgcgga gccccggacc cgctcccgcc gcctccggct cgcccagggg gggtcgccgg 240

gaggagcccg ggggagaggg accaggaggg gcccgcggcc tcgcaggggc gcccgcgccc 300

ccacccctgc ccccgccagc ggaccggtcc cccacccccg gtccttccac c atg cac 357
Met His
1

ttg ctg ggc ttc ttc tct gtg gcg tgt tct ctg ctc gcc gct gcg ctg 405
Leu Leu Gly Phe Phe Ser Val Ala Cys Ser Leu Leu Ala Ala Ala Leu
5 10 15

ctc ccg ggt cct cgc gag gcg ccc gcc gcc gcc gcc gcc ttc gag tcc 453
Leu Pro Gly Pro Arg Glu Ala Pro Ala Ala Ala Ala Ala Phe Glu Ser
20 25 30

gga ctc gac ctc tcg gac gcg gag ccc gac gcg ggc gag gcc acg gct 501
Gly Leu Asp Leu Ser Asp Ala Glu Pro Asp Ala Gly Glu Ala Thr Ala
35 40 45 50

tat gca agc aaa gat ctg gag gag cag tta cgg tct gtg tcc agt gta 549
Tyr Ala Ser Lys Asp Leu Glu Glu Gln Leu Arg Ser Val Ser Ser Val
55 60 65

gat gaa ctc atg act gta ctc tac cca gaa tat tgg aaa atg tac aag 597
Asp Glu Leu Met Thr Val Leu Tyr Pro Glu Tyr Trp Lys Met Tyr Lys
70 75 80

tgt cag cta agg aaa gga ggc tgg caa cat aac aga gaa cag gcc aac 645
Cys Gln Leu Arg Lys Gly Gly Trp Gln His Asn Arg Glu Gln Ala Asn
85 90 95

ctc aac tca agg aca gaa gag act ata aaa ttt gct gca gca cat tat 693
Leu Asn Ser Arg Thr Glu Glu Thr Ile Lys Phe Ala Ala Ala His Tyr
100 105 110

aat aca gag atc ttg aaa agt att gat aat gag tgg aga aag act caa 741
Asn Thr Glu Ile Leu Lys Ser Ile Asp Asn Glu Trp Arg Lys Thr Gln
115 120 125 130

tgc atg cca cgg gag gtg tgt ata gat gtg ggg aag gag ttt gga gtc 789
Cys Met Pro Arg Glu Val Cys Ile Asp Val Gly Lys Glu Phe Gly Val
135 140 145

```
gcg aca aac acc ttc ttt aaa cct cca tgt gtg tcc gtc tac aga tgt      837
Ala Thr Asn Thr Phe Phe Lys Pro Pro Cys Val Ser Val Tyr Arg Cys
          150                 155                 160

ggg ggt tgc tgc aat agt gag ggg ctg cag tgc atg aac acc agc acg      885
Gly Gly Cys Cys Asn Ser Glu Gly Leu Gln Cys Met Asn Thr Ser Thr
      165                 170                 175

agc tac ctc agc aag acg tta ttt gaa att aca gtg cct ctc tct caa      933
Ser Tyr Leu Ser Lys Thr Leu Phe Glu Ile Thr Val Pro Leu Ser Gln
  180                 185                 190

ggc ccc aaa cca gta aca atc agt ttt gcc aat cac act tcc tgc cga      981
Gly Pro Lys Pro Val Thr Ile Ser Phe Ala Asn His Thr Ser Cys Arg
195                 200                 205                 210

tgc atg tct aaa ctg gat gtt tac aga caa gtt cat tcc att att aga     1029
Cys Met Ser Lys Leu Asp Val Tyr Arg Gln Val His Ser Ile Ile Arg
              215                 220                 225

cgt tcc ctg cca gca aca cta cca cag tgt cag gca gcg aac aag acc     1077
Arg Ser Leu Pro Ala Thr Leu Pro Gln Cys Gln Ala Ala Asn Lys Thr
          230                 235                 240

tgc ccc acc aat tac atg tgg aat aat cac atc tgc aga tgc ctg gct     1125
Cys Pro Thr Asn Tyr Met Trp Asn Asn His Ile Cys Arg Cys Leu Ala
      245                 250                 255

cag gaa gat ttt atg ttt tcc tcg gat gct gga gat gac tca aca gat     1173
Gln Glu Asp Phe Met Phe Ser Ser Asp Ala Gly Asp Asp Ser Thr Asp
  260                 265                 270

gga ttc cat gac atc tgt gga cca aac aag gag ctg gat gaa gag acc     1221
Gly Phe His Asp Ile Cys Gly Pro Asn Lys Glu Leu Asp Glu Glu Thr
275                 280                 285                 290

tgt cag tgt gtc tgc aga gcg ggg ctt cgg cct gcc agc tgt gga ccc     1269
Cys Gln Cys Val Cys Arg Ala Gly Leu Arg Pro Ala Ser Cys Gly Pro
              295                 300                 305

cac aaa gaa cta gac aga aac tca tgc cag tgt gtc tgt aaa aac aaa     1317
His Lys Glu Leu Asp Arg Asn Ser Cys Gln Cys Val Cys Lys Asn Lys
          310                 315                 320

ctc ttc ccc agc caa tgt ggg gcc aac cga gaa ttt gat gaa aac aca     1365
Leu Phe Pro Ser Gln Cys Gly Ala Asn Arg Glu Phe Asp Glu Asn Thr
      325                 330                 335

tgc cag tgt gta tgt aaa aga acc tgc ccc aga aat caa ccc cta aat     1413
Cys Gln Cys Val Cys Lys Arg Thr Cys Pro Arg Asn Gln Pro Leu Asn
  340                 345                 350

cct gga aaa tgt gcc tgt gaa tgt aca gaa agt cca cag aaa tgc ttg     1461
Pro Gly Lys Cys Ala Cys Glu Cys Thr Glu Ser Pro Gln Lys Cys Leu
355                 360                 365                 370

tta aaa gga aag aag ttc cac cac caa aca tgc agc tgt tac aga cgg     1509
Leu Lys Gly Lys Lys Phe His His Gln Thr Cys Ser Cys Tyr Arg Arg
              375                 380                 385

cca tgt acg aac cgc cag aag gct tgt gag cca gga ttt tca tat agt     1557
Pro Cys Thr Asn Arg Gln Lys Ala Cys Glu Pro Gly Phe Ser Tyr Ser
          390                 395                 400
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gaa gaa gtg tgt cgt tgt gtc cct tca tat tgg aaa aga cca caa atg 1605
Glu Glu Val Cys Arg Cys Val Pro Ser Tyr Trp Lys Arg Pro Gln Met
405 410 415

agc taa gattgtactg ttttccagtt catcgatttt ctattatgga aaactgtgtt 1661
Ser

gccacagtag aactgtctgt gaacagagag acccttgtgg gtccatgcta acaaagacaa 1721

aagtctgtct ttcctgaacc atgtggataa ctttacagaa atggactgga gctcatctgc 1781

aaaaggcctc ttgtaaagac tggttttctg ccaatgacca aacagccaag attttcctct 1841

tgtgatttct ttaaaagaat gactatataa tttatttcca ctaaaaatat tgtttctgca 1901

ttcattttta tagcaacaac aattggtaaa actcactgtg atcaatattt ttatatcatg 1961

caaaatatgt ttaaaataaa atgaaaattg tattat 1997

<210> 24
<211> 419
<212> PRT
<213> Homo sapiens

<400> 24

Met His Leu Leu Gly Phe Phe Ser Val Ala Cys Ser Leu Leu Ala Ala
1 5 10 15

Ala Leu Leu Pro Gly Pro Arg Glu Ala Pro Ala Ala Ala Ala Ala Phe
20 25 30

Glu Ser Gly Leu Asp Leu Ser Asp Ala Glu Pro Asp Ala Gly Glu Ala
35 40 45

Thr Ala Tyr Ala Ser Lys Asp Leu Glu Glu Gln Leu Arg Ser Val Ser
50 55 60

Ser Val Asp Glu Leu Met Thr Val Leu Tyr Pro Glu Tyr Trp Lys Met
65 70 75 80

Tyr Lys Cys Gln Leu Arg Lys Gly Gly Trp Gln His Asn Arg Glu Gln
85 90 95

Ala Asn Leu Asn Ser Arg Thr Glu Glu Thr Ile Lys Phe Ala Ala Ala
100 105 110

His Tyr Asn Thr Glu Ile Leu Lys Ser Ile Asp Asn Glu Trp Arg Lys
115 120 125

Thr Gln Cys Met Pro Arg Glu Val Cys Ile Asp Val Gly Lys Glu Phe
130 135 140

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Gly Val Ala Thr Asn Thr Phe Phe Lys Pro Pro Cys Val Ser Val Tyr
145                 150                 155                 160

Arg Cys Gly Gly Cys Cys Asn Ser Glu Gly Leu Gln Cys Met Asn Thr
                165                 170                 175

Ser Thr Ser Tyr Leu Ser Lys Thr Leu Phe Glu Ile Thr Val Pro Leu
            180                 185                 190

Ser Gln Gly Pro Lys Pro Val Thr Ile Ser Phe Ala Asn His Thr Ser
        195                 200                 205

Cys Arg Cys Met Ser Lys Leu Asp Val Tyr Arg Gln Val His Ser Ile
    210                 215                 220

Ile Arg Arg Ser Leu Pro Ala Thr Leu Pro Gln Cys Gln Ala Ala Asn
225                 230                 235                 240

Lys Thr Cys Pro Thr Asn Tyr Met Trp Asn Asn His Ile Cys Arg Cys
                245                 250                 255

Leu Ala Gln Glu Asp Phe Met Phe Ser Ser Asp Ala Gly Asp Asp Ser
            260                 265                 270

Thr Asp Gly Phe His Asp Ile Cys Gly Pro Asn Lys Glu Leu Asp Glu
        275                 280                 285

Glu Thr Cys Gln Cys Val Cys Arg Ala Gly Leu Arg Pro Ala Ser Cys
    290                 295                 300

Gly Pro His Lys Glu Leu Asp Arg Asn Ser Cys Gln Cys Val Cys Lys
305                 310                 315                 320

Asn Lys Leu Phe Pro Ser Gln Cys Gly Ala Asn Arg Glu Phe Asp Glu
                325                 330                 335

Asn Thr Cys Gln Cys Val Cys Lys Arg Thr Cys Pro Arg Asn Gln Pro
            340                 345                 350

Leu Asn Pro Gly Lys Cys Ala Cys Glu Cys Thr Glu Ser Pro Gln Lys
        355                 360                 365

Cys Leu Leu Lys Gly Lys Lys Phe His His Gln Thr Cys Ser Cys Tyr
    370                 375                 380

Arg Arg Pro Cys Thr Asn Arg Gln Lys Ala Cys Glu Pro Gly Phe Ser
385                 390                 395                 400
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Tyr Ser Glu Glu Val Cys Arg Cys Val Pro Ser Tyr Trp Lys Arg Pro
405 410 415

Gln Met Ser

<210> 25
<211> 2029
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (411)..(1475)

<400> 25
gttgggttcc agctttctgt agctgtaagc attggtggcc acaccacctc cttacaaagc 60

aactagaacc tgcggcatac attggagaga ttttttaat tttctggaca tgaagtaaat 120

ttagagtgct ttctaatttc aggtagaaga catgtccacc ttctgattat ttttggagaa 180

cattttgatt tttttcatct ctctctcccc acccctaaga ttgtgcaaaa aaagcgtacc 240

ttgcctaatt gaaataattt cattggattt tgatcagaac tgattatttg gttttctgtg 300

tgaagttttg aggtttcaaa ctttccttct ggagaatgcc ttttgaaaca attttctcta 360

gctgcctgat gtcaactgct tagtaatcag tggatattga aatattcaaa atg tac 416
Met Tyr
1

aga gag tgg gta gtg gtg aat gtt ttc atg atg ttg tac gtc cag ctg 464
Arg Glu Trp Val Val Val Asn Val Phe Met Met Leu Tyr Val Gln Leu
5 10 15

gtg cag ggc tcc agt aat gaa cat gga cca gtg aag cga tca tct cag 512
Val Gln Gly Ser Ser Asn Glu His Gly Pro Val Lys Arg Ser Ser Gln
20 25 30

tcc aca ttg gaa cga tct gaa cag cag atc agg gct gct tct agt ttg 560
Ser Thr Leu Glu Arg Ser Glu Gln Gln Ile Arg Ala Ala Ser Ser Leu
35 40 45 50

gag gaa cta ctt cga att act cac tct gag gac tgg aag ctg tgg aga 608
Glu Glu Leu Leu Arg Ile Thr His Ser Glu Asp Trp Lys Leu Trp Arg
55 60 65

tgc agg ctg agg ctc aaa agt ttt acc agt atg gac tct cgc tca gca 656
Cys Arg Leu Arg Leu Lys Ser Phe Thr Ser Met Asp Ser Arg Ser Ala
70 75 80

tcc cat cgg tcc act agg ttt gcg gca act ttc tat gac att gaa aca 704
Ser His Arg Ser Thr Arg Phe Ala Ala Thr Phe Tyr Asp Ile Glu Thr
85 90 95

cta aaa gtt ata gat gaa gaa tgg caa aga act cag tgc agc cct aga 752
Leu Lys Val Ile Asp Glu Glu Trp Gln Arg Thr Gln Cys Ser Pro Arg
100 105 110

gaa acg tgc gtg gag gtg gcc agt gag ctg ggg aag agt acc aac aca 800
Glu Thr Cys Val Glu Val Ala Ser Glu Leu Gly Lys Ser Thr Asn Thr
115 120 125 130

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ttc ttc aag ccc cct tgt gtg aac gtg ttc cga tgt ggt ggc tgt tgc      848
Phe Phe Lys Pro Pro Cys Val Asn Val Phe Arg Cys Gly Gly Cys Cys
                135                 140                 145

aat gaa gag agc ctt atc tgt atg aac acc agc acc tcg tac att tcc      896
Asn Glu Glu Ser Leu Ile Cys Met Asn Thr Ser Thr Ser Tyr Ile Ser
            150                 155                 160

aaa cag ctc ttt gag ata tca gtg cct ttg aca tca gta cct gaa tta      944
Lys Gln Leu Phe Glu Ile Ser Val Pro Leu Thr Ser Val Pro Glu Leu
        165                 170                 175


gtg cct gtt aaa gtt gcc aat cat aca ggt tgt aag tgc ttg cca aca      992
Val Pro Val Lys Val Ala Asn His Thr Gly Cys Lys Cys Leu Pro Thr
    180                 185                 190

gcc ccc cgc cat cca tac tca att atc aga aga tcc atc cag atc cct     1040
Ala Pro Arg His Pro Tyr Ser Ile Ile Arg Arg Ser Ile Gln Ile Pro
195                 200                 205                 210

gaa gaa gat cgc tgt tcc cat tcc aag aaa ctc tgt cct att gac atg     1088
Glu Glu Asp Arg Cys Ser His Ser Lys Lys Leu Cys Pro Ile Asp Met
                215                 220                 225

cta tgg gat agc aac aaa tgt aaa tgt gtt ttg cag gag gaa aat cca     1136
Leu Trp Asp Ser Asn Lys Cys Lys Cys Val Leu Gln Glu Glu Asn Pro
            230                 235                 240

ctt gct gga aca gaa gac cac tct cat ctc cag gaa cca gct ctc tgt     1184
Leu Ala Gly Thr Glu Asp His Ser His Leu Gln Glu Pro Ala Leu Cys
        245                 250                 255

ggg cca cac atg atg ttt gac gaa gat cgt tgc gag tgt gtc tgt aaa     1232
Gly Pro His Met Met Phe Asp Glu Asp Arg Cys Glu Cys Val Cys Lys
    260                 265                 270

aca cca tgt ccc aaa gat cta atc cag cac ccc aaa aac tgc agt tgc     1280
Thr Pro Cys Pro Lys Asp Leu Ile Gln His Pro Lys Asn Cys Ser Cys
275                 280                 285                 290

ttt gag tgc aaa gaa agt ctg gag acc tgc tgc cag aag cac aag cta     1328
Phe Glu Cys Lys Glu Ser Leu Glu Thr Cys Cys Gln Lys His Lys Leu
                295                 300                 305

ttt cac cca gac acc tgc agc tgt gag gac aga tgc ccc ttt cat acc     1376
Phe His Pro Asp Thr Cys Ser Cys Glu Asp Arg Cys Pro Phe His Thr
            310                 315                 320

aga cca tgt gca agt ggc aaa aca gca tgt gca aag cat tgc cgc ttt     1424
Arg Pro Cys Ala Ser Gly Lys Thr Ala Cys Ala Lys His Cys Arg Phe
        325                 330                 335

cca aag gag aaa agg gct gcc cag ggg ccc cac agc cga aag aat cct     1472
Pro Lys Glu Lys Arg Ala Ala Gln Gly Pro His Ser Arg Lys Asn Pro
    340                 345                 350

tga ttcagcgttc caagttcccc atccctgtca tttttaacag catgctgctt          1525

tgccaagttg ctgtcactgt ttttttccca ggtgttaaaa aaaaaatcca ttttacacag   1585

caccacagtg aatccagacc aaccttccat tcacaccagc taaggagtcc ctggttcatt   1645
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gatggatgtc ttctagctgc agatgcctct gcgcaccaag gaatggagag gaggggaccc 1705

atgtaatcct tttgtttagt tttgtttttg ttttttggtg aatgagaaag gtgtgctggt 1765

catggaatgg caggtgtcat atgactgatt actcagagca gatgaggaaa actgtagtct 1825

ctgagtcctt tgctaatcgc aactcttgtg aattattctg attcttttt atgcagaatt 1885

tgattcgtat gatcagtact gactttctga ttactgtcca gcttatagtc ttccagttta 1945

atgaactacc atctgatgtt tcatatttaa gtgtatttaa agaaaataaa caccattatt 2005

caagccaaaa aaaaaaaaaa aaaa 2029

<210> 26
<211> 354
<212> PRT
<213> Homo sapiens

<400> 26

Met Tyr Arg Glu Trp Val Val Val Asn Val Phe Met Met Leu Tyr Val
1 5 10 15

Gln Leu Val Gln Gly Ser Ser Asn Glu His Gly Pro Val Lys Arg Ser
20 25 30

Ser Gln Ser Thr Leu Glu Arg Ser Glu Gln Gln Ile Arg Ala Ala Ser
35 40 45

Ser Leu Glu Glu Leu Leu Arg Ile Thr His Ser Glu Asp Trp Lys Leu
50 55 60

Trp Arg Cys Arg Leu Arg Leu Lys Ser Phe Thr Ser Met Asp Ser Arg
65 70 75 80

Ser Ala Ser His Arg Ser Thr Arg Phe Ala Ala Thr Phe Tyr Asp Ile
85 90 95

Glu Thr Leu Lys Val Ile Asp Glu Glu Trp Gln Arg Thr Gln Cys Ser
100 105 110

Pro Arg Glu Thr Cys Val Glu Val Ala Ser Glu Leu Gly Lys Ser Thr
115 120 125

Asn Thr Phe Phe Lys Pro Pro Cys Val Asn Val Phe Arg Cys Gly Gly
130 135 140

Cys Cys Asn Glu Glu Ser Leu Ile Cys Met Asn Thr Ser Thr Ser Tyr
145 150 155 160

```
Ile Ser Lys Gln Leu Phe Glu Ile Ser Val Pro Leu Thr Ser Val Pro
                165                 170                 175

Glu Leu Val Pro Val Lys Val Ala Asn His Thr Gly Cys Lys Cys Leu
            180                 185                 190

Pro Thr Ala Pro Arg His Pro Tyr Ser Ile Ile Arg Arg Ser Ile Gln
        195                 200                 205

Ile Pro Glu Glu Asp Arg Cys Ser His Ser Lys Lys Leu Cys Pro Ile
    210                 215                 220

Asp Met Leu Trp Asp Ser Asn Lys Cys Lys Cys Val Leu Gln Glu Glu
225                 230                 235                 240

Asn Pro Leu Ala Gly Thr Glu Asp His Ser His Leu Gln Glu Pro Ala
                245                 250                 255

Leu Cys Gly Pro His Met Met Phe Asp Glu Asp Arg Cys Glu Cys Val
            260                 265                 270

Cys Lys Thr Pro Cys Pro Lys Asp Leu Ile Gln His Pro Lys Asn Cys
        275                 280                 285

Ser Cys Phe Glu Cys Lys Glu Ser Leu Glu Thr Cys Cys Gln Lys His
    290                 295                 300

Lys Leu Phe His Pro Asp Thr Cys Ser Cys Glu Asp Arg Cys Pro Phe
305                 310                 315                 320

His Thr Arg Pro Cys Ala Ser Gly Lys Thr Ala Cys Ala Lys His Cys
                325                 330                 335

Arg Phe Pro Lys Glu Lys Arg Ala Ala Gln Gly Pro His Ser Arg Lys
            340                 345                 350

Asn Pro
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<210> 27
<211> 1645
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (322)..(771)

<400> 27
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tccccgggac ccgcctgccc ctcggcgccc cgccccgccg ggccgctccc cgtcgggttc    120

cccagccaca gccttaccta cgggctcctg actccgcaag gcttccagaa gatgctcgaa    180

ccaccggccg gggcctcggg gcagcagtga gggaggcgtc cagcccccca ctcagctctt    240

ctcctcctgt gccaggggct ccccggggga tgagcatggt ggttttccct cggagccccc    300

tggctcggga cgtctgagaa g atg ccg gtc atg agg ctg ttc cct tgc ttc      351
                        Met Pro Val Met Arg Leu Phe Pro Cys Phe
                        1               5                   10

ctg cag ctc ctg gcc ggg ctg gcg ctg cct gct gtg ccc ccc cag cag      399
Leu Gln Leu Leu Ala Gly Leu Ala Leu Pro Ala Val Pro Pro Gln Gln
                15                  20                  25

tgg gcc ttg tct gct ggg aac ggc tcg tca gag gtg gaa gtg gta ccc      447
Trp Ala Leu Ser Ala Gly Asn Gly Ser Ser Glu Val Glu Val Val Pro
            30                  35                  40

ttc cag gaa gtg tgg ggc cgc agc tac tgc cgg gcg ctg gag agg ctg      495
Phe Gln Glu Val Trp Gly Arg Ser Tyr Cys Arg Ala Leu Glu Arg Leu
        45                  50                  55

gtg gac gtc gtg tcc gag tac ccc agc gag gtg gag cac atg ttc agc      543
Val Asp Val Val Ser Glu Tyr Pro Ser Glu Val Glu His Met Phe Ser
    60                  65                  70

cca tcc tgt gtc tcc ctg ctg cgc tgc acc ggc tgc tgc ggc gat gag      591
Pro Ser Cys Val Ser Leu Leu Arg Cys Thr Gly Cys Cys Gly Asp Glu
75                  80                  85                  90

aat ctg cac tgt gtg ccg gtg gag acg gcc aat gtc acc atg cag ctc      639
Asn Leu His Cys Val Pro Val Glu Thr Ala Asn Val Thr Met Gln Leu
                95                  100                 105

cta aag atc cgt tct ggg gac cgg ccc tcc tac gtg gag ctg acg ttc      687
Leu Lys Ile Arg Ser Gly Asp Arg Pro Ser Tyr Val Glu Leu Thr Phe
            110                 115                 120

tct cag cac gtt cgc tgc gaa tgc cgg cct ctg cgg gag aag atg aag      735
Ser Gln His Val Arg Cys Glu Cys Arg Pro Leu Arg Glu Lys Met Lys
        125                 130                 135

ccg gaa agg tgc ggc gat gct gtt ccc cgg agg taa cccacccctt           781
Pro Glu Arg Cys Gly Asp Ala Val Pro Arg Arg
    140                 145

ggaggagaga gaccccgcac ccggctcgtg tatttattac cgtcacactc ttcagtgact    841

cctgctggta cctgccctct atttattagc caactgtttc cctgctgaat gcctcgctcc    901

cttcaagacg aggggcaggg aaggacagga ccctcaggaa ttcagtgcct tcaacaacgt    961

gagagaaaga gagaagccag ccacagaccc ctgggagctt ccgctttgaa agaagcaaga   1021

cacgtggcct cgtgaggggc aagctaggcc ccagaggccc tggaggtctc caggggcctg   1081

cagaaggaaa gaaggggccc ctgctacctg ttcttgggcc tcaggctctg cacagacaag   1141

cagcccttgc tttcggagct cctgtccaaa gtagggatgc ggattctgct ggggccgcca   1201
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cggcctggtg gtgggaaggc cggcagcggg cggaggggat tcagccactt ccccctcttc 1261

ttctgaagat cagaacattc agctctggag aacagtggtt gcctgggggc ttttgccact 1321

ccttgtcccc cgtgatctcc cctcacactt tgccatttgc ttgtactggg acattgttct 1381

ttccggccga ggtgccacca ccctgccccc actaagagac acatacagag tgggccccgg 1441

gctggagaaa gagctgcctg gatgagaaac agctcagcca gtggggatga ggtcaccagg 1501

ggaggagcct gtgcgtccca gctgaaggca gtggcagggg agcaggttcc ccaagggccc 1561

tggcaccccc acaagctgtc cctgcagggc catctgactg ccaagccaga ttctcttgaa 1621

taaagtattc tagtgtggaa acgc 1645

<210> 28
<211> 149
<212> PRT
<213> Homo sapiens

<400> 28

Met Pro Val Met Arg Leu Phe Pro Cys Phe Leu Gln Leu Leu Ala Gly
1 5 10 15

Leu Ala Leu Pro Ala Val Pro Pro Gln Gln Trp Ala Leu Ser Ala Gly
20 25 30

Asn Gly Ser Ser Glu Val Glu Val Val Pro Phe Gln Glu Val Trp Gly
35 40 45

Arg Ser Tyr Cys Arg Ala Leu Glu Arg Leu Val Asp Val Val Ser Glu
50 55 60

Tyr Pro Ser Glu Val Glu His Met Phe Ser Pro Ser Cys Val Ser Leu
65 70 75 80

Leu Arg Cys Thr Gly Cys Cys Gly Asp Glu Asn Leu His Cys Val Pro
85 90 95

Val Glu Thr Ala Asn Val Thr Met Gln Leu Leu Lys Ile Arg Ser Gly
100 105 110

Asp Arg Pro Ser Tyr Val Glu Leu Thr Phe Ser Gln His Val Arg Cys
115 120 125

Glu Cys Arg Pro Leu Arg Glu Lys Met Lys Pro Glu Arg Cys Gly Asp
130 135 140

Ala Val Pro Arg Arg
145

<210> 29
<211> 4230
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(4065)

<400> 29

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agc aag gtg ctg ctg gcc gtc gcc ctg tgg ctc tgc gtg gag acc cgg      48
Ser Lys Val Leu Leu Ala Val Ala Leu Trp Leu Cys Val Glu Thr Arg
1               5                  10                  15

gcc gcc tct gtg ggt ttg cct agt gtt tct ctt gat ctg ccc agg ctc      96
Ala Ala Ser Val Gly Leu Pro Ser Val Ser Leu Asp Leu Pro Arg Leu
            20                  25                  30

agc ata caa aaa gac ata ctt aca att aag gct aat aca act ctt caa     144
Ser Ile Gln Lys Asp Ile Leu Thr Ile Lys Ala Asn Thr Thr Leu Gln
        35                  40                  45

att act tgc agg gga cag agg gac ttg gac tgg ctt tgg ccc aat aat     192
Ile Thr Cys Arg Gly Gln Arg Asp Leu Asp Trp Leu Trp Pro Asn Asn
    50                  55                  60

cag agt ggc agt gag caa agg gtg gag gtg act gag tgc agc gat ggc     240
Gln Ser Gly Ser Glu Gln Arg Val Glu Val Thr Glu Cys Ser Asp Gly
65                  70                  75                  80

ctc ttc tgt aag aca ctc aca att cca aaa gtg atc gga aat gac act     288
Leu Phe Cys Lys Thr Leu Thr Ile Pro Lys Val Ile Gly Asn Asp Thr
                85                  90                  95

gga gcc tac aag tgc ttc tac cgg gaa act gac ttg gcc tcg gtc att     336
Gly Ala Tyr Lys Cys Phe Tyr Arg Glu Thr Asp Leu Ala Ser Val Ile
            100                 105                 110

tat gtc tat gtt caa gat tac aga tct cca ttt att gct tct gtt agt     384
Tyr Val Tyr Val Gln Asp Tyr Arg Ser Pro Phe Ile Ala Ser Val Ser
        115                 120                 125

gac caa cat gga gtc gtg tac att act gag aac aaa aac aaa act gtg     432
Asp Gln His Gly Val Val Tyr Ile Thr Glu Asn Lys Asn Lys Thr Val
    130                 135                 140

gtg att cca tgt ctc ggg tcc att tca aat ctc aac gtg tca ctt tgt     480
Val Ile Pro Cys Leu Gly Ser Ile Ser Asn Leu Asn Val Ser Leu Cys
145                 150                 155                 160

gca aga tac cca gaa aag aga ttt gtt cct gat ggt aac aga att tcc     528
Ala Arg Tyr Pro Glu Lys Arg Phe Val Pro Asp Gly Asn Arg Ile Ser
                165                 170                 175

tgg gac agc aag aag ggc ttt act att ccc agc tac atg atc agc tat     576
Trp Asp Ser Lys Lys Gly Phe Thr Ile Pro Ser Tyr Met Ile Ser Tyr
            180                 185                 190

gct ggc atg gtc ttc tgt gaa gca aaa att aat gat gaa agt tac cag     624
Ala Gly Met Val Phe Cys Glu Ala Lys Ile Asn Asp Glu Ser Tyr Gln
        195                 200                 205
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tct att atg tac ata gtt gtc gtt gta ggg tat agg att tat gat gtg      672
Ser Ile Met Tyr Ile Val Val Val Val Gly Tyr Arg Ile Tyr Asp Val
    210                 215                 220

gtt ctg agt ccg tct cat gga att gaa cta tct gtt gga gaa aag ctt      720
Val Leu Ser Pro Ser His Gly Ile Glu Leu Ser Val Gly Glu Lys Leu
225                 230                 235                 240

gtc tta aat tgt aca gca aga act gaa cta aat gtg ggg att gac ttc      768
Val Leu Asn Cys Thr Ala Arg Thr Glu Leu Asn Val Gly Ile Asp Phe
                245                 250                 255

aac tgg gaa tac cct tct tcg aag cat cag cat aag aaa ctt gta aac      816
Asn Trp Glu Tyr Pro Ser Ser Lys His Gln His Lys Lys Leu Val Asn
            260                 265                 270

cga gac cta aaa acc cag tct ggg agt gag atg aag aaa ttt ttg agc      864
Arg Asp Leu Lys Thr Gln Ser Gly Ser Glu Met Lys Lys Phe Leu Ser
        275                 280                 285

acc tta act ata gat ggt gta acc cgg agt gac caa gga ttg tac acc      912
Thr Leu Thr Ile Asp Gly Val Thr Arg Ser Asp Gln Gly Leu Tyr Thr
    290                 295                 300

tgt gca gca tcc agt ggg ctg atg acc aag aag aac agc aca ttt gtc      960
Cys Ala Ala Ser Ser Gly Leu Met Thr Lys Lys Asn Ser Thr Phe Val
305                 310                 315                 320

agg gtc cat gaa aaa cct ttt gtt gct ttt gga agt ggc atg gaa tct     1008
Arg Val His Glu Lys Pro Phe Val Ala Phe Gly Ser Gly Met Glu Ser
                325                 330                 335

ctg gtg gaa gcc acg gtg ggg gag cgt gtc aga atc cct gcg aag tac     1056
Leu Val Glu Ala Thr Val Gly Glu Arg Val Arg Ile Pro Ala Lys Tyr
            340                 345                 350

ctt ggt tac cca ccc cca gaa ata aaa tgg tat aaa aat gga ata ccc     1104
Leu Gly Tyr Pro Pro Pro Glu Ile Lys Trp Tyr Lys Asn Gly Ile Pro
        355                 360                 365

ctt gag tcc aat cac aca att aaa gcg ggg cat gta ctg acg att atg     1152
Leu Glu Ser Asn His Thr Ile Lys Ala Gly His Val Leu Thr Ile Met
    370                 375                 380

gaa gtg agt gaa aga gac aca gga aat tac act gtc atc ctt acc aat     1200
Glu Val Ser Glu Arg Asp Thr Gly Asn Tyr Thr Val Ile Leu Thr Asn
385                 390                 395                 400

ccc att tca aag gag aag cag agc cat gtg gtc tct ctg gtt gtg tat     1248
Pro Ile Ser Lys Glu Lys Gln Ser His Val Val Ser Leu Val Val Tyr
                405                 410                 415

gtc cca ccc cag att ggt gag aaa tct cta atc tct cct gtg gat tcc     1296
Val Pro Pro Gln Ile Gly Glu Lys Ser Leu Ile Ser Pro Val Asp Ser
            420                 425                 430

tac cag tac ggc acc act caa acg ctg aca tgt acg gtc tat gcc att     1344
Tyr Gln Tyr Gly Thr Thr Gln Thr Leu Thr Cys Thr Val Tyr Ala Ile
        435                 440                 445

cct ccc ccg cat cac atc cac tgg tat tgg cag ttg gag gaa gag tgc     1392
Pro Pro Pro His His Ile His Trp Tyr Trp Gln Leu Glu Glu Glu Cys
    450                 455                 460
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gcc aac gag ccc agc caa gct gtc tca gtg aca aac cca tac cct tgt 1440
Ala Asn Glu Pro Ser Gln Ala Val Ser Val Thr Asn Pro Tyr Pro Cys
465 470 475 480

gaa gaa tgg aga agt gtg gag gac ttc cag gga gga aat aaa att gaa 1488
Glu Glu Trp Arg Ser Val Glu Asp Phe Gln Gly Gly Asn Lys Ile Glu
485 490 495

gtt aat aaa aat caa ttt gct cta att gaa gga aaa aac aaa act gta 1536
Val Asn Lys Asn Gln Phe Ala Leu Ile Glu Gly Lys Asn Lys Thr Val
500 505 510

agt acc ctt gtt atc caa gcg gca aat gtg tca gct ttg tac aaa tgt 1584
Ser Thr Leu Val Ile Gln Ala Ala Asn Val Ser Ala Leu Tyr Lys Cys
515 520 525

gaa gcg gtc aac aaa gtc ggg aga gga gag agg gtg atc tcc ttc cac 1632
Glu Ala Val Asn Lys Val Gly Arg Gly Glu Arg Val Ile Ser Phe His
530 535 540

gtg acc agg ggt cct gaa att act ttg caa cct gac atg cag ccc act 1680
Val Thr Arg Gly Pro Glu Ile Thr Leu Gln Pro Asp Met Gln Pro Thr
545 550 555 560

gag cag gag agc gtg tct ttg tgg tgc act gca gac aga tct acg ttt 1728
Glu Gln Glu Ser Val Ser Leu Trp Cys Thr Ala Asp Arg Ser Thr Phe
565 570 575

gag aac ctc aca tgg tac aag ctt ggc cca cag cct ctg cca atc cat 1776
Glu Asn Leu Thr Trp Tyr Lys Leu Gly Pro Gln Pro Leu Pro Ile His
580 585 590

gtg gga gag ttg ccc aca cct gtt tgc aag aac ttg gat act ctt tgg 1824
Val Gly Glu Leu Pro Thr Pro Val Cys Lys Asn Leu Asp Thr Leu Trp
595 600 605

aaa ttg aat gcc acc atg ttc tct aat agc aca aat gac att ttg atc 1872
Lys Leu Asn Ala Thr Met Phe Ser Asn Ser Thr Asn Asp Ile Leu Ile
610 615 620

atg gag ctt aag aat gca tcc ttg cag gac caa gga gac tat gtc tgc 1920
Met Glu Leu Lys Asn Ala Ser Leu Gln Asp Gln Gly Asp Tyr Val Cys
625 630 635 640

ctt gct caa gac agg aag acc aag aaa aga cat tgc gtg gtc agg cag 1968
Leu Ala Gln Asp Arg Lys Thr Lys Lys Arg His Cys Val Val Arg Gln
645 650 655

ctc aca gtc cta gag cgt gtg gca ccc acg atc aca gga aac ctg gag 2016
Leu Thr Val Leu Glu Arg Val Ala Pro Thr Ile Thr Gly Asn Leu Glu
660 665 670

aat cag acg aca agt att ggg gaa agc atc gaa gtc tca tgc acg gca 2064
Asn Gln Thr Thr Ser Ile Gly Glu Ser Ile Glu Val Ser Cys Thr Ala
675 680 685

tct ggg aat ccc cct cca cag atc atg tgg ttt aaa gat aat gag acc 2112
Ser Gly Asn Pro Pro Pro Gln Ile Met Trp Phe Lys Asp Asn Glu Thr
690 695 700

ctt gta gaa gac tca ggc att gta ttg aag gat ggg aac cgg aac ctc 2160
Leu Val Glu Asp Ser Gly Ile Val Leu Lys Asp Gly Asn Arg Asn Leu
705 710 715 720

act atc cgc aga gtg agg aag gag gac gaa ggc ctc tac acc tgc cag 2208
Thr Ile Arg Arg Val Arg Lys Glu Asp Glu Gly Leu Tyr Thr Cys Gln
725 730 735

gca tgc agt gtt ctt ggc tgt gca aaa gtg gag gca ttt ttc ata ata 2256
Ala Cys Ser Val Leu Gly Cys Ala Lys Val Glu Ala Phe Phe Ile Ile
740 745 750

gaa ggt gcc cag gaa aag acg aac ttg gaa atc att att cta gta ggc 2304
Glu Gly Ala Gln Glu Lys Thr Asn Leu Glu Ile Ile Ile Leu Val Gly
755 760 765

acg acg gtg att gcc atg ttc ttc tgg cta ctt ctt gtc atc atc cta 2352
Thr Thr Val Ile Ala Met Phe Phe Trp Leu Leu Leu Val Ile Ile Leu
770 775 780

ggg acc gtt aag cgg gcc aat gga ggg gaa ctg aag aca ggc tac ttg 2400
Gly Thr Val Lys Arg Ala Asn Gly Gly Glu Leu Lys Thr Gly Tyr Leu
785 790 795 800

tcc atc gtc atg gat cca gat gaa ctc cca ttg gat gaa cat tgt gaa 2448
Ser Ile Val Met Asp Pro Asp Glu Leu Pro Leu Asp Glu His Cys Glu
805 810 815

cga ctg cct tat gat gcc agc aaa tgg gaa ttc ccc aga gac cgg ctg 2496
Arg Leu Pro Tyr Asp Ala Ser Lys Trp Glu Phe Pro Arg Asp Arg Leu
820 825 830

aac cta ggt aag cct ctt ggc cgt ggt gcc ttt ggc caa gag att gaa 2544
Asn Leu Gly Lys Pro Leu Gly Arg Gly Ala Phe Gly Gln Glu Ile Glu
835 840 845

gca gat gcc ttt gga att gac aag aca gca act tgc agg aca gta gca 2592
Ala Asp Ala Phe Gly Ile Asp Lys Thr Ala Thr Cys Arg Thr Val Ala
850 855 860

gtc aaa atg ttg aaa gaa gga gca aca cac agt gag cat cga gct ctc 2640
Val Lys Met Leu Lys Glu Gly Ala Thr His Ser Glu His Arg Ala Leu
865 870 875 880

atg tct gaa ctc aag atc ctc att cat att ggt cac cat ctc aat gtg 2688
Met Ser Glu Leu Lys Ile Leu Ile His Ile Gly His His Leu Asn Val
885 890 895

gtc aac ctt cta ggt gcc tgt acc aag cca gga ggg cca ctc atg gtg 2736
Val Asn Leu Leu Gly Ala Cys Thr Lys Pro Gly Gly Pro Leu Met Val
900 905 910

att gtg gaa ttc tgc aaa ttt gga aac ctg tcc act tac ctg agg agc 2784
Ile Val Glu Phe Cys Lys Phe Gly Asn Leu Ser Thr Tyr Leu Arg Ser
915 920 925

aag aga aat gaa ttt gtc ccc tac aag acc aaa ggg gca cga ttc cgt 2832
Lys Arg Asn Glu Phe Val Pro Tyr Lys Thr Lys Gly Ala Arg Phe Arg
930 935 940

caa ggg aaa gac tac gtt gga gca atc cct gtg gat ctg aaa cgg cgc 2880
Gln Gly Lys Asp Tyr Val Gly Ala Ile Pro Val Asp Leu Lys Arg Arg
945 950 955 960

ttg gac agc atc acc agt agc cag agc tca gcc agc tct gga ttt gtg 2928
Leu Asp Ser Ile Thr Ser Ser Gln Ser Ser Ala Ser Ser Gly Phe Val
965 970 975

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gag gag aag tcc ctc agt gat gta gaa gaa gag gaa gct cct gaa gat      2976
Glu Glu Lys Ser Leu Ser Asp Val Glu Glu Glu Glu Ala Pro Glu Asp
            980                 985                 990

ctg tat aag gac ttc ctg acc ttg gag cat ctc atc tgt tac agc ttc      3024
Leu Tyr Lys Asp Phe Leu Thr Leu Glu His Leu Ile Cys Tyr Ser Phe
        995                 1000                1005

caa gtg gct aag ggc atg gag ttc ttg gca tcg cga aag tgt atc          3069
Gln Val Ala Lys Gly Met Glu Phe Leu Ala Ser Arg Lys Cys Ile
    1010                1015                1020

cac agg gac ctg gcg gca cga aat atc ctc tta tcg gag aag aac          3114
His Arg Asp Leu Ala Ala Arg Asn Ile Leu Leu Ser Glu Lys Asn
    1025                1030                1035

gtg gtt aaa atc tgt gac ttt ggc ttg gcc cgg gat att tat aaa          3159
Val Val Lys Ile Cys Asp Phe Gly Leu Ala Arg Asp Ile Tyr Lys
    1040                1045                1050

gat cca gat tat gtc aga aaa gga gat gct cgc ctc cct ttg aaa          3204
Asp Pro Asp Tyr Val Arg Lys Gly Asp Ala Arg Leu Pro Leu Lys
    1055                1060                1065

tgg atg gcc cca gaa aca att ttt gac aga gtg tac aca atc cag          3249
Trp Met Ala Pro Glu Thr Ile Phe Asp Arg Val Tyr Thr Ile Gln
    1070                1075                1080

agt gac gtc tgg tct ttt ggt gtt ttg ctg tgg gaa ata ttt tcc          3294
Ser Asp Val Trp Ser Phe Gly Val Leu Leu Trp Glu Ile Phe Ser
    1085                1090                1095

tta ggt gct tct cca tat cct ggg gta aag att gat gaa gaa ttt          3339
Leu Gly Ala Ser Pro Tyr Pro Gly Val Lys Ile Asp Glu Glu Phe
    1100                1105                1110

tgt agg cga ttg aaa gaa gga act aga atg agg gcc cct gat tat          3384
Cys Arg Arg Leu Lys Glu Gly Thr Arg Met Arg Ala Pro Asp Tyr
    1115                1120                1125

act aca cca gaa atg tac cag acc atg ctg gac tgc tgg cac ggg          3429
Thr Thr Pro Glu Met Tyr Gln Thr Met Leu Asp Cys Trp His Gly
    1130                1135                1140

gag ccc agt cag aga ccc acg ttt tca gag ttg gtg gaa cat ttg          3474
Glu Pro Ser Gln Arg Pro Thr Phe Ser Glu Leu Val Glu His Leu
    1145                1150                1155

gga aat ctc ttg caa gct aat gct cag cag gat ggc aaa gac tac          3519
Gly Asn Leu Leu Gln Ala Asn Ala Gln Gln Asp Gly Lys Asp Tyr
    1160                1165                1170

att gtt ctt ccg ata tca gag act ttg agc atg gaa gag gat tct          3564
Ile Val Leu Pro Ile Ser Glu Thr Leu Ser Met Glu Glu Asp Ser
    1175                1180                1185

gga ctc tct ctg cct acc tca cct gtt tcc tgt atg gag gag gag          3609
Gly Leu Ser Leu Pro Thr Ser Pro Val Ser Cys Met Glu Glu Glu
    1190                1195                1200

gaa gta tgt gac ccc aaa ttc cat tat gac aac aca gca gga atc          3654
Glu Val Cys Asp Pro Lys Phe His Tyr Asp Asn Thr Ala Gly Ile
    1205                1210                1215
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agt cag  tat ctg cag aac agt  aag cga aag agc cgg  cct gtg agt      3699
Ser Gln  Tyr Leu Gln Asn Ser  Lys Arg Lys Ser Arg  Pro Val Ser
    1220                 1225                 1230

gta aaa  aca ttt gaa gat atc  ccg tta gaa gaa cca  gaa gta aaa      3744
Val Lys  Thr Phe Glu Asp Ile  Pro Leu Glu Glu Pro  Glu Val Lys
    1235                 1240                 1245

gta atc  cca gat gac aac cag  acg gac agt ggt atg  gtt ctt gcc      3789
Val Ile  Pro Asp Asp Asn Gln  Thr Asp Ser Gly Met  Val Leu Ala
    1250                 1255                 1260

tca gaa  gag ctg aaa act ttg  gaa gac aga acc aaa  tta tct cca      3834
Ser Glu  Glu Leu Lys Thr Leu  Glu Asp Arg Thr Lys  Leu Ser Pro
    1265                 1270                 1275

tct ttt  ggt gga atg gtg ccc  agc aaa agc agg gag  tct gtg gca      3879
Ser Phe  Gly Gly Met Val Pro  Ser Lys Ser Arg Glu  Ser Val Ala
    1280                 1285                 1290

tct gaa  ggc tca aac cag aca  agc ggc tac cag tcc  gga tat cac      3924
Ser Glu  Gly Ser Asn Gln Thr  Ser Gly Tyr Gln Ser  Gly Tyr His
    1295                 1300                 1305

tcc gat  gac aca gac acc acc  gtg tac tcc agt gag  gaa gca gaa      3969
Ser Asp  Asp Thr Asp Thr Thr  Val Tyr Ser Ser Glu  Glu Ala Glu
    1310                 1315                 1320

ctt tta  aag ctg ata gag att  gga gtg caa acc ggt  agc aca gcc      4014
Leu Leu  Lys Leu Ile Glu Ile  Gly Val Gln Thr Gly  Ser Thr Ala
    1325                 1330                 1335

cag att  ctc cag cct gac acg  ggg acc aca ctg agc  tct cct cct      4059
Gln Ile  Leu Gln Pro Asp Thr  Gly Thr Thr Leu Ser  Ser Pro Pro
    1340                 1345                 1350

gtt taa aaggaagcat ccacacccca actcccggac atcacatgag aggtctgctc      4115
Val

agattttgaa gtgttgttct ttccaccagc aggaagtagc cgcatttgat tttcatttcg   4175

acaacagaaa aaggacctcg gactgcaggg agccagctct tctaggcttg tgacc        4230
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<210> 30
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<213> Homo sapiens

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Ala Ala Ser Val Gly Leu Pro Ser Val Ser Leu Asp Leu Pro Arg Leu
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Ser Ile Gln Lys Asp Ile Leu Thr Ile Lys Ala Asn Thr Thr Leu Gln
        35                  40                  45
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Ile Thr Cys Arg Gly Gln Arg Asp Leu Asp Trp Leu Trp Pro Asn Asn
50 55 60

Gln Ser Gly Ser Glu Gln Arg Val Glu Val Thr Glu Cys Ser Asp Gly
65 70 75 80

Leu Phe Cys Lys Thr Leu Thr Ile Pro Lys Val Ile Gly Asn Asp Thr
85 90 95

Gly Ala Tyr Lys Cys Phe Tyr Arg Glu Thr Asp Leu Ala Ser Val Ile
100 105 110

Tyr Val Tyr Val Gln Asp Tyr Arg Ser Pro Phe Ile Ala Ser Val Ser
115 120 125

Asp Gln His Gly Val Val Tyr Ile Thr Glu Asn Lys Asn Lys Thr Val
130 135 140

Val Ile Pro Cys Leu Gly Ser Ile Ser Asn Leu Asn Val Ser Leu Cys
145 150 155 160

Ala Arg Tyr Pro Glu Lys Arg Phe Val Pro Asp Gly Asn Arg Ile Ser
165 170 175

Trp Asp Ser Lys Lys Gly Phe Thr Ile Pro Ser Tyr Met Ile Ser Tyr
180 185 190

Ala Gly Met Val Phe Cys Glu Ala Lys Ile Asn Asp Glu Ser Tyr Gln
195 200 205

Ser Ile Met Tyr Ile Val Val Val Val Gly Tyr Arg Ile Tyr Asp Val
210 215 220

Val Leu Ser Pro Ser His Gly Ile Glu Leu Ser Val Gly Glu Lys Leu
225 230 235 240

Val Leu Asn Cys Thr Ala Arg Thr Glu Leu Asn Val Gly Ile Asp Phe
245 250 255

Asn Trp Glu Tyr Pro Ser Ser Lys His Gln His Lys Lys Leu Val Asn
260 265 270

Arg Asp Leu Lys Thr Gln Ser Gly Ser Glu Met Lys Lys Phe Leu Ser
275 280 285

Thr Leu Thr Ile Asp Gly Val Thr Arg Ser Asp Gln Gly Leu Tyr Thr
290 295 300

Cys Ala Ala Ser Ser Gly Leu Met Thr Lys Lys Asn Ser Thr Phe Val
305 310 315 320

Arg Val His Glu Lys Pro Phe Val Ala Phe Gly Ser Gly Met Glu Ser
325 330 335

Leu Val Glu Ala Thr Val Gly Glu Arg Val Arg Ile Pro Ala Lys Tyr
340 345 350

Leu Gly Tyr Pro Pro Pro Glu Ile Lys Trp Tyr Lys Asn Gly Ile Pro
355 360 365

Leu Glu Ser Asn His Thr Ile Lys Ala Gly His Val Leu Thr Ile Met
370 375 380

Glu Val Ser Glu Arg Asp Thr Gly Asn Tyr Thr Val Ile Leu Thr Asn
385 390 395 400

Pro Ile Ser Lys Glu Lys Gln Ser His Val Val Ser Leu Val Val Tyr
405 410 415

Val Pro Pro Gln Ile Gly Glu Lys Ser Leu Ile Ser Pro Val Asp Ser
420 425 430

Tyr Gln Tyr Gly Thr Thr Gln Thr Leu Thr Cys Thr Val Tyr Ala Ile
435 440 445

Pro Pro Pro His His Ile His Trp Tyr Trp Gln Leu Glu Glu Glu Cys
450 455 460

Ala Asn Glu Pro Ser Gln Ala Val Ser Val Thr Asn Pro Tyr Pro Cys
465 470 475 480

Glu Glu Trp Arg Ser Val Glu Asp Phe Gln Gly Gly Asn Lys Ile Glu
485 490 495

Val Asn Lys Asn Gln Phe Ala Leu Ile Glu Gly Lys Asn Lys Thr Val
500 505 510

Ser Thr Leu Val Ile Gln Ala Ala Asn Val Ser Ala Leu Tyr Lys Cys
515 520 525

Glu Ala Val Asn Lys Val Gly Arg Gly Glu Arg Val Ile Ser Phe His
530 535 540

Val Thr Arg Gly Pro Glu Ile Thr Leu Gln Pro Asp Met Gln Pro Thr
545 550 555 560

Glu Gln Glu Ser Val Ser Leu Trp Cys Thr Ala Asp Arg Ser Thr Phe
565 570 575

Glu Asn Leu Thr Trp Tyr Lys Leu Gly Pro Gln Pro Leu Pro Ile His
580 585 590

Val Gly Glu Leu Pro Thr Pro Val Cys Lys Asn Leu Asp Thr Leu Trp
595 600 605

Lys Leu Asn Ala Thr Met Phe Ser Asn Ser Thr Asn Asp Ile Leu Ile
610 615 620

Met Glu Leu Lys Asn Ala Ser Leu Gln Asp Gln Gly Asp Tyr Val Cys
625 630 635 640

Leu Ala Gln Asp Arg Lys Thr Lys Lys Arg His Cys Val Val Arg Gln
645 650 655

Leu Thr Val Leu Glu Arg Val Ala Pro Thr Ile Thr Gly Asn Leu Glu
660 665 670

Asn Gln Thr Thr Ser Ile Gly Glu Ser Ile Glu Val Ser Cys Thr Ala
675 680 685

Ser Gly Asn Pro Pro Pro Gln Ile Met Trp Phe Lys Asp Asn Glu Thr
690 695 700

Leu Val Glu Asp Ser Gly Ile Val Leu Lys Asp Gly Asn Arg Asn Leu
705 710 715 720

Thr Ile Arg Arg Val Arg Lys Glu Asp Glu Gly Leu Tyr Thr Cys Gln
725 730 735

Ala Cys Ser Val Leu Gly Cys Ala Lys Val Glu Ala Phe Phe Ile Ile
740 745 750

Glu Gly Ala Gln Glu Lys Thr Asn Leu Glu Ile Ile Ile Leu Val Gly
755 760 765

Thr Thr Val Ile Ala Met Phe Phe Trp Leu Leu Leu Val Ile Ile Leu
770 775 780

Gly Thr Val Lys Arg Ala Asn Gly Gly Glu Leu Lys Thr Gly Tyr Leu
785 790 795 800

Ser Ile Val Met Asp Pro Asp Glu Leu Pro Leu Asp Glu His Cys Glu
805 810 815

Arg Leu Pro Tyr Asp Ala Ser Lys Trp Glu Phe Pro Arg Asp Arg Leu
820 825 830

Asn Leu Gly Lys Pro Leu Gly Arg Gly Ala Phe Gly Gln Glu Ile Glu
835 840 845

Ala Asp Ala Phe Gly Ile Asp Lys Thr Ala Thr Cys Arg Thr Val Ala
850 855 860

Val Lys Met Leu Lys Glu Gly Ala Thr His Ser Glu His Arg Ala Leu
865 870 875 880

Met Ser Glu Leu Lys Ile Leu Ile His Ile Gly His His Leu Asn Val
885 890 895

Val Asn Leu Leu Gly Ala Cys Thr Lys Pro Gly Gly Pro Leu Met Val
900 905 910

Ile Val Glu Phe Cys Lys Phe Gly Asn Leu Ser Thr Tyr Leu Arg Ser
915 920 925

Lys Arg Asn Glu Phe Val Pro Tyr Lys Thr Lys Gly Ala Arg Phe Arg
930 935 940

Gln Gly Lys Asp Tyr Val Gly Ala Ile Pro Val Asp Leu Lys Arg Arg
945 950 955 960

Leu Asp Ser Ile Thr Ser Ser Gln Ser Ser Ala Ser Ser Gly Phe Val
965 970 975

Glu Glu Lys Ser Leu Ser Asp Val Glu Glu Glu Glu Ala Pro Glu Asp
980 985 990

Leu Tyr Lys Asp Phe Leu Thr Leu Glu His Leu Ile Cys Tyr Ser Phe
995 1000 1005

Gln Val Ala Lys Gly Met Glu Phe Leu Ala Ser Arg Lys Cys Ile
1010 1015 1020

His Arg Asp Leu Ala Ala Arg Asn Ile Leu Leu Ser Glu Lys Asn
1025 1030 1035

Val Val Lys Ile Cys Asp Phe Gly Leu Ala Arg Asp Ile Tyr Lys
1040 1045 1050

Asp Pro Asp Tyr Val Arg Lys Gly Asp Ala Arg Leu Pro Leu Lys
1055 1060 1065

Trp Met Ala Pro Glu Thr Ile Phe Asp Arg Val Tyr Thr Ile Gln
1070 1075 1080

Ser Asp Val Trp Ser Phe Gly Val Leu Leu Trp Glu Ile Phe Ser
1085 1090 1095

Leu Gly Ala Ser Pro Tyr Pro Gly Val Lys Ile Asp Glu Glu Phe
1100 1105 1110

Cys Arg Arg Leu Lys Glu Gly Thr Arg Met Arg Ala Pro Asp Tyr
1115 1120 1125

Thr Thr Pro Glu Met Tyr Gln Thr Met Leu Asp Cys Trp His Gly
1130 1135 1140

Glu Pro Ser Gln Arg Pro Thr Phe Ser Glu Leu Val Glu His Leu
1145 1150 1155

Gly Asn Leu Leu Gln Ala Asn Ala Gln Gln Asp Gly Lys Asp Tyr
1160 1165 1170

Ile Val Leu Pro Ile Ser Glu Thr Leu Ser Met Glu Glu Asp Ser
1175 1180 1185

Gly Leu Ser Leu Pro Thr Ser Pro Val Ser Cys Met Glu Glu Glu
1190 1195 1200

Glu Val Cys Asp Pro Lys Phe His Tyr Asp Asn Thr Ala Gly Ile
1205 1210 1215

Ser Gln Tyr Leu Gln Asn Ser Lys Arg Lys Ser Arg Pro Val Ser
1220 1225 1230

Val Lys Thr Phe Glu Asp Ile Pro Leu Glu Glu Pro Glu Val Lys
1235 1240 1245

Val Ile Pro Asp Asp Asn Gln Thr Asp Ser Gly Met Val Leu Ala
1250 1255 1260

Ser Glu Glu Leu Lys Thr Leu Glu Asp Arg Thr Lys Leu Ser Pro
1265 1270 1275

Ser Phe Gly Gly Met Val Pro Ser Lys Ser Arg Glu Ser Val Ala
1280 1285 1290

Ser Glu Gly Ser Asn Gln Thr Ser Gly Tyr Gln Ser Gly Tyr His
1295 1300 1305

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Ser Asp  Asp Thr Asp Thr Thr  Val Tyr Ser Ser Glu  Glu Ala Glu
    1310                 1315                 1320

Leu Leu  Lys Leu Ile Glu Ile  Gly Val Gln Thr Gly  Ser Thr Ala
    1325                 1330                 1335

Gln Ile  Leu Gln Pro Asp Thr  Gly Thr Thr Leu Ser  Ser Pro Pro
    1340                 1345                 1350

Val
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<210> 31
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                       Met Gln Arg Gly Ala Ala Leu Cys Leu Arg Leu
                         1               5                  10

tgg ctc tgc ctg gga ctc ctg gac ggc ctg gtg agt ggc tac tcc atg  100
Trp Leu Cys Leu Gly Leu Leu Asp Gly Leu Val Ser Gly Tyr Ser Met
            15                  20                  25

acc ccc ccg acc ttg aac atc acg gag gag tca cac gtc atc gac acc  148
Thr Pro Pro Thr Leu Asn Ile Thr Glu Glu Ser His Val Ile Asp Thr
        30                  35                  40

ggt gac agc ctg tcc atc tcc tgc agg gga cag cac ccc ctc gag tgg  196
Gly Asp Ser Leu Ser Ile Ser Cys Arg Gly Gln His Pro Leu Glu Trp
    45                  50                  55

gct tgg cca gga gct cag gag gcg cca gcc acc gga gac aag gac agc  244
Ala Trp Pro Gly Ala Gln Glu Ala Pro Ala Thr Gly Asp Lys Asp Ser
60                  65                  70                  75

gag gac acg ggg gtg gtg cga gac tgc gag ggc aca gac gcc agg ccc  292
Glu Asp Thr Gly Val Val Arg Asp Cys Glu Gly Thr Asp Ala Arg Pro
                80                  85                  90

tac tgc aag gtg ttg ctg ctg cac gag gta cat gcc aac gac aca ggc  340
Tyr Cys Lys Val Leu Leu Leu His Glu Val His Ala Asn Asp Thr Gly
            95                  100                 105

agc tac gtc tgc tac tac aag tac atc aag gca cgc atc gag ggc acc  388
Ser Tyr Val Cys Tyr Tyr Lys Tyr Ile Lys Ala Arg Ile Glu Gly Thr
        110                 115                 120

acg gcc gcc agc tcc tac gtg ttc gtg aga gac ttt gag cag cca ttc  436
Thr Ala Ala Ser Ser Tyr Val Phe Val Arg Asp Phe Glu Gln Pro Phe
    125                 130                 135

atc aac aag cct gac acg ctc ttg gtc aac agg aag gac gcc atg tgg  484
Ile Asn Lys Pro Asp Thr Leu Leu Val Asn Arg Lys Asp Ala Met Trp
140                 145                 150                 155
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gtg ccc tgt ctg gtg tcc atc ccc ggc ctc aat gtc acg ctg cgc tcg   532
Val Pro Cys Leu Val Ser Ile Pro Gly Leu Asn Val Thr Leu Arg Ser
                160                 165                 170

caa agc tcg gtg ctg tgg cca gac ggg cag gag gtg gtg tgg gat gac   580
Gln Ser Ser Val Leu Trp Pro Asp Gly Gln Glu Val Val Trp Asp Asp
            175                 180                 185

cgg cgg ggc atg ctc gtg tcc acg cca ctg ctg cac gat gcc ctg tac   628
Arg Arg Gly Met Leu Val Ser Thr Pro Leu Leu His Asp Ala Leu Tyr
        190                 195                 200

ctg cag tgc gag acc acc tgg gga gac cag gac ttc ctt tcc aac ccc   676
Leu Gln Cys Glu Thr Thr Trp Gly Asp Gln Asp Phe Leu Ser Asn Pro
    205                 210                 215

ttc ctg gtg cac atc aca ggc aac gag ctc tat gac atc cag ctg ttg   724
Phe Leu Val His Ile Thr Gly Asn Glu Leu Tyr Asp Ile Gln Leu Leu
220                 225                 230                 235

ccc agg aag tcg ctg gag ctg ctg gta ggg gag aag ctg gtc ctg aac   772
Pro Arg Lys Ser Leu Glu Leu Leu Val Gly Glu Lys Leu Val Leu Asn
                240                 245                 250

tgc acc gtg tgg gct gag ttt aac tca ggt gtc acc ttt gac tgg gac   820
Cys Thr Val Trp Ala Glu Phe Asn Ser Gly Val Thr Phe Asp Trp Asp
            255                 260                 265

tac cca ggg aag cag gca gag cgg ggt aag tgg gtg ccc gag cga cgc   868
Tyr Pro Gly Lys Gln Ala Glu Arg Gly Lys Trp Val Pro Glu Arg Arg
        270                 275                 280

tcc cag cag acc cac aca gaa ctc tcc agc atc ctg acc atc cac aac   916
Ser Gln Gln Thr His Thr Glu Leu Ser Ser Ile Leu Thr Ile His Asn
    285                 290                 295

gtc agc cag cac gac ctg ggc tcg tat gtg tgc aag gcc aac aac ggc   964
Val Ser Gln His Asp Leu Gly Ser Tyr Val Cys Lys Ala Asn Asn Gly
300                 305                 310                 315

atc cag cga ttt cgg gag agc acc gag gtc att gtg cat gaa aat ccc   1012
Ile Gln Arg Phe Arg Glu Ser Thr Glu Val Ile Val His Glu Asn Pro
                320                 325                 330

ttc atc agc gtc gag tgg ctc aaa gga ccc atc ctg gag gcc acg gca   1060
Phe Ile Ser Val Glu Trp Leu Lys Gly Pro Ile Leu Glu Ala Thr Ala
            335                 340                 345

gga gac gag ctg gtg aag ctg ccc gtg aag ctg gca gcg tac ccc ccg   1108
Gly Asp Glu Leu Val Lys Leu Pro Val Lys Leu Ala Ala Tyr Pro Pro
        350                 355                 360

ccc gag ttc cag tgg tac aag gat gga aag gca ctg tcc ggg cgc cac   1156
Pro Glu Phe Gln Trp Tyr Lys Asp Gly Lys Ala Leu Ser Gly Arg His
    365                 370                 375

agt cca cat gcc ctg gtg ctc aag gag gtg aca gag gcc agc aca ggc   1204
Ser Pro His Ala Leu Val Leu Lys Glu Val Thr Glu Ala Ser Thr Gly
380                 385                 390                 395
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acc tac acc ctc gcc ctg tgg aac tcc gct gct ggc ctg agg cgc aac   1252
Thr Tyr Thr Leu Ala Leu Trp Asn Ser Ala Ala Gly Leu Arg Arg Asn
                400                 405                 410

atc agc ctg gag ctg gtg gtg aat gtg ccc ccc cag ata cat gag aag   1300
Ile Ser Leu Glu Leu Val Val Asn Val Pro Pro Gln Ile His Glu Lys
            415                 420                 425

gag gcc tcc tcc ccc agc atc tac tcg cgt cac agc cgc cag gcc ctc   1348
Glu Ala Ser Ser Pro Ser Ile Tyr Ser Arg His Ser Arg Gln Ala Leu
        430                 435                 440

acc tgc acg gcc tac ggg gtg ccc ctg cct ctc agc atc cag tgg cac   1396
Thr Cys Thr Ala Tyr Gly Val Pro Leu Pro Leu Ser Ile Gln Trp His
    445                 450                 455

tgg cgg ccc tgg aca ccc tgc aag atg ttt gcc cag cgt agt ctc cgg   1444
Trp Arg Pro Trp Thr Pro Cys Lys Met Phe Ala Gln Arg Ser Leu Arg
460                 465                 470                 475

cgg cgg cag cag caa gac ctc atg cca cag tgc cgt gac tgg agg gcg   1492
Arg Arg Gln Gln Gln Asp Leu Met Pro Gln Cys Arg Asp Trp Arg Ala
                480                 485                 490

gtg acc acg cag gat gcc gtg aac ccc atc gag agc ctg gac acc tgg   1540
Val Thr Thr Gln Asp Ala Val Asn Pro Ile Glu Ser Leu Asp Thr Trp
            495                 500                 505

acc gag ttt gtg gag gga aag aat aag act gtg agc aag ctg gtg atc   1588
Thr Glu Phe Val Glu Gly Lys Asn Lys Thr Val Ser Lys Leu Val Ile
        510                 515                 520

cag aat gcc aac gtg tct gcc atg tac aag tgt gtg gtc tcc aac aag   1636
Gln Asn Ala Asn Val Ser Ala Met Tyr Lys Cys Val Val Ser Asn Lys
    525                 530                 535

gtg ggc cag gat gag cgg ctc atc tac ttc tat gtg acc acc atc ccc   1684
Val Gly Gln Asp Glu Arg Leu Ile Tyr Phe Tyr Val Thr Thr Ile Pro
540                 545                 550                 555

gac ggc ttc acc atc gaa tcc aag cca tcc gag gag cta cta gag ggc   1732
Asp Gly Phe Thr Ile Glu Ser Lys Pro Ser Glu Glu Leu Leu Glu Gly
                560                 565                 570

cag ccg gtg ctc ctg agc tgc caa gcc gac agc tac aag tac gag cat   1780
Gln Pro Val Leu Leu Ser Cys Gln Ala Asp Ser Tyr Lys Tyr Glu His
            575                 580                 585

ctg cgc tgg tac cgc ctc aac ctg tcc acg ctg cac gat gcg cac ggg   1828
Leu Arg Trp Tyr Arg Leu Asn Leu Ser Thr Leu His Asp Ala His Gly
        590                 595                 600

aac ccg ctt ctg ctc gac tgc aag aac gtg cat ctg ttc gcc acc cct   1876
Asn Pro Leu Leu Leu Asp Cys Lys Asn Val His Leu Phe Ala Thr Pro
    605                 610                 615

ctg gcc gcc agc ctg gag gag gtg gca cct ggg gcg cgc cac gcc acg   1924
Leu Ala Ala Ser Leu Glu Glu Val Ala Pro Gly Ala Arg His Ala Thr
620                 625                 630                 635

ctc agc ctg agt atc ccc cgc gtc gcg ccc gag cac gag ggc cac tat   1972
Leu Ser Leu Ser Ile Pro Arg Val Ala Pro Glu His Glu Gly His Tyr
                640                 645                 650
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gtg tgc gaa gtg caa gac cgg cgc agc cat gac aag cac tgc cac aag   2020
Val Cys Glu Val Gln Asp Arg Arg Ser His Asp Lys His Cys His Lys
            655                 660                 665

aag tac ctg tcg gtg cag gcc ctg gaa gcc cct cgg ctc acg cag aac   2068
Lys Tyr Leu Ser Val Gln Ala Leu Glu Ala Pro Arg Leu Thr Gln Asn
        670                 675                 680

ttg acc gac ctc ctg gtg aac gtg agc gac tcg ctg gag atg cag tgc   2116
Leu Thr Asp Leu Leu Val Asn Val Ser Asp Ser Leu Glu Met Gln Cys
    685                 690                 695

ttg gtg gcc gga gcg cac gcg ccc agc atc gtg tgg tac aaa gac gag   2164
Leu Val Ala Gly Ala His Ala Pro Ser Ile Val Trp Tyr Lys Asp Glu
700                 705                 710                 715

agg ctg ctg gag gaa aag tct gga gtc gac ttg gcg gac tcc aac cag   2212
Arg Leu Leu Glu Glu Lys Ser Gly Val Asp Leu Ala Asp Ser Asn Gln
                720                 725                 730

aag ctg agc atc cag cgc gtg cgc gag gag gat gcg gga cgc tat ctg   2260
Lys Leu Ser Ile Gln Arg Val Arg Glu Glu Asp Ala Gly Arg Tyr Leu
            735                 740                 745

tgc agc gtg tgc aac gcc aag ggc tgc gtc aac tcc tcc gcc agc gtg   2308
Cys Ser Val Cys Asn Ala Lys Gly Cys Val Asn Ser Ser Ala Ser Val
        750                 755                 760

gcc gtg gaa ggc tcc gag gat aag ggc agc atg gag atc gtg atc ctt   2356
Ala Val Glu Gly Ser Glu Asp Lys Gly Ser Met Glu Ile Val Ile Leu
    765                 770                 775

gtc ggt acc ggc gtc atc gct gtc ttc ttc tgg gtc ctc ctc ctc ctc   2404
Val Gly Thr Gly Val Ile Ala Val Phe Phe Trp Val Leu Leu Leu Leu
780                 785                 790                 795

atc ttc tgt aac atg agg agg ccg gcc cac gca gac atc aag acg ggc   2452
Ile Phe Cys Asn Met Arg Arg Pro Ala His Ala Asp Ile Lys Thr Gly
                800                 805                 810

tac ctg tcc atc atc atg gac ccc ggg gag gtg cct ctg gag gag caa   2500
Tyr Leu Ser Ile Ile Met Asp Pro Gly Glu Val Pro Leu Glu Glu Gln
            815                 820                 825

tgc gaa tac ctg tcc tac gat gcc agc cag tgg gaa ttc ccc cga gag   2548
Cys Glu Tyr Leu Ser Tyr Asp Ala Ser Gln Trp Glu Phe Pro Arg Glu
        830                 835                 840

cgg ctg cac ctg ggg aga gtg ctc ggc tac ggc gcc ttc ggg aag gtg   2596
Arg Leu His Leu Gly Arg Val Leu Gly Tyr Gly Ala Phe Gly Lys Val
    845                 850                 855

gtg gaa gcc tcc gct ttc ggc atc cac aag ggc agc agc tgt gac acc   2644
Val Glu Ala Ser Ala Phe Gly Ile His Lys Gly Ser Ser Cys Asp Thr
860                 865                 870                 875

gtg gcc gtg aaa atg ctg aaa gag ggc gcc acg gcc agc gag cac cgc   2692
Val Ala Val Lys Met Leu Lys Glu Gly Ala Thr Ala Ser Glu His Arg
                880                 885                 890

gcg ctg atg tcg gag ctc aag atc ctc att cac atc ggc aac cac ctc   2740
Ala Leu Met Ser Glu Leu Lys Ile Leu Ile His Ile Gly Asn His Leu
            895                 900                 905
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aac gtg gtc aac ctc ctc ggg gcg tgc acc aag ccg cag ggc ccc ctc   2788
Asn Val Val Asn Leu Leu Gly Ala Cys Thr Lys Pro Gln Gly Pro Leu
        910                 915                 920

atg gtg atc gtg gag ttc tgc aag tac ggc aac ctc tcc aac ttc ctg   2836
Met Val Ile Val Glu Phe Cys Lys Tyr Gly Asn Leu Ser Asn Phe Leu
    925                 930                 935

cgc gcc aag cgg gac gcc ttc agc ccc tgc gcg gag aag tct ccc gag   2884
Arg Ala Lys Arg Asp Ala Phe Ser Pro Cys Ala Glu Lys Ser Pro Glu
940                 945                 950                 955

cag cgc gga cgc ttc cgc gcc atg gtg gag ctc gcc agg ctg gat cgg   2932
Gln Arg Gly Arg Phe Arg Ala Met Val Glu Leu Ala Arg Leu Asp Arg
                960                 965                 970

agg cgg ccg ggg agc agc gac agg gtc ctc ttc gcg cgg ttc tcg aag   2980
Arg Arg Pro Gly Ser Ser Asp Arg Val Leu Phe Ala Arg Phe Ser Lys
            975                 980                 985

acc gag ggc gga gcg agg cgg gct tct cca gac caa gaa gct gag gac   3028
Thr Glu Gly Gly Ala Arg Arg Ala Ser Pro Asp Gln Glu Ala Glu Asp
        990                 995                 1000

ctg tgg ctg agc ccg ctg acc atg gaa gat ctt gtc tgc tac agc ttc   3076
Leu Trp Leu Ser Pro Leu Thr Met Glu Asp Leu Val Cys Tyr Ser Phe
    1005                1010                1015

cag gtg gcc aga ggg atg gag ttc ctg gct tcc cga aag tgc atc cac   3124
Gln Val Ala Arg Gly Met Glu Phe Leu Ala Ser Arg Lys Cys Ile His
1020                1025                1030                1035

aga gac ctg gct gct cgg aac att ctg ctg tcg gaa agc gac gtg gtg   3172
Arg Asp Leu Ala Ala Arg Asn Ile Leu Leu Ser Glu Ser Asp Val Val
                1040                1045                1050

aag atc tgt gac ttt ggc ctt gcc cgg gac atc tac aaa gac cct gac   3220
Lys Ile Cys Asp Phe Gly Leu Ala Arg Asp Ile Tyr Lys Asp Pro Asp
            1055                1060                1065

tac gtc cgc aag ggc agt gcc cgg ctg ccc ctg aag tgg atg gcc cct   3268
Tyr Val Arg Lys Gly Ser Ala Arg Leu Pro Leu Lys Trp Met Ala Pro
        1070                1075                1080

gaa agc atc ttc gac aag gtg tac acc acg cag agt gac gtg tgg tcc   3316
Glu Ser Ile Phe Asp Lys Val Tyr Thr Thr Gln Ser Asp Val Trp Ser
    1085                1090                1095

ttt ggg gtg ctt ctc tgg gag atc ttc tct ctg ggg gcc tcc ccg tac   3364
Phe Gly Val Leu Leu Trp Glu Ile Phe Ser Leu Gly Ala Ser Pro Tyr
1100                1105                1110                1115

cct ggg gtg cag atc aat gag gag ttc tgc cag cgg ctg aga gac ggc   3412
Pro Gly Val Gln Ile Asn Glu Glu Phe Cys Gln Arg Leu Arg Asp Gly
                1120                1125                1130

aca agg atg agg gcc ccg gag ctg gcc act ccc gcc ata cgc cgc atc   3460
Thr Arg Met Arg Ala Pro Glu Leu Ala Thr Pro Ala Ile Arg Arg Ile
            1135                1140                1145

atg ctg aac tgc tgg tcc gga gac ccc aag gcg aga cct gca ttc tcg   3508
Met Leu Asn Cys Trp Ser Gly Asp Pro Lys Ala Arg Pro Ala Phe Ser
        1150                1155                1160
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gag ctg gtg gag atc ctg ggg gac ctg ctc cag ggc agg ggc ctg caa   3556
Glu Leu Val Glu Ile Leu Gly Asp Leu Leu Gln Gly Arg Gly Leu Gln
   1165                1170                1175

gag gaa gag gag gtc tgc atg gcc ccg cgc agc tct cag agc tca gaa   3604
Glu Glu Glu Glu Val Cys Met Ala Pro Arg Ser Ser Gln Ser Ser Glu
1180                1185                1190                1195

gag ggc agc ttc tcg cag gtg tcc acc atg gcc cta cac atc gcc cag   3652
Glu Gly Ser Phe Ser Gln Val Ser Thr Met Ala Leu His Ile Ala Gln
               1200                1205                1210

gct gac gct gag gac agc ccg cca agc ctg cag cgc cac agc ctg gcc   3700
Ala Asp Ala Glu Asp Ser Pro Pro Ser Leu Gln Arg His Ser Leu Ala
           1215                1220                1225

gcc agg tat tac aac tgg gtg tcc ttt ccc ggg tgc ctg gcc aga ggg   3748
Ala Arg Tyr Tyr Asn Trp Val Ser Phe Pro Gly Cys Leu Ala Arg Gly
       1230                1235                1240

gct gag acc cgt ggt tcc tcc agg atg aag aca ttt gag gaa ttc ccc   3796
Ala Glu Thr Arg Gly Ser Ser Arg Met Lys Thr Phe Glu Glu Phe Pro
   1245                1250                1255

atg acc cca acg acc tac aaa ggc tct gtg gac aac cag aca gac agt   3844
Met Thr Pro Thr Thr Tyr Lys Gly Ser Val Asp Asn Gln Thr Asp Ser
1260                1265                1270                1275

ggg atg gtg ctg gcc tcg gag gag ttt gag cag ata gag agc agg cat   3892
Gly Met Val Leu Ala Ser Glu Glu Phe Glu Gln Ile Glu Ser Arg His
               1280                1285                1290

aga caa gaa agc ggc ttc agg tagctgaagc agagagagag aaggcagcat      3943
Arg Gln Glu Ser Gly Phe Arg
           1295

acgtcagcat tttcttctct gcacttataa gaaagatcaa agactttaag actttcgcta 4003

tttcttctac tgctatctac tacaaacttc aaagaggaac caggaggaca agaggagcat 4063

gaaagtggac aaggagtgtg accactgaag caccacaggg aaggggttag gcctccggat 4123

gactgcgggc aggcctggat aatatccagc ctcccacaag aagctggtgg agcagagtgt 4183

tccctgactc ct                                                     4195
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<213> Homo sapiens

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Leu Leu Asp Gly Leu Val Ser Gly Tyr Ser Met Thr Pro Pro Thr Leu
             20                  25                  30

Asn Ile Thr Glu Glu Ser His Val Ile Asp Thr Gly Asp Ser Leu Ser
         35                  40                  45
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Ile Ser Cys Arg Gly Gln His Pro Leu Glu Trp Ala Trp Pro Gly Ala
50 55 60

Gln Glu Ala Pro Ala Thr Gly Asp Lys Asp Ser Glu Asp Thr Gly Val
65 70 75 80

Val Arg Asp Cys Glu Gly Thr Asp Ala Arg Pro Tyr Cys Lys Val Leu
85 90 95

Leu Leu His Glu Val His Ala Asn Asp Thr Gly Ser Tyr Val Cys Tyr
100 105 110

Tyr Lys Tyr Ile Lys Ala Arg Ile Glu Gly Thr Thr Ala Ala Ser Ser
115 120 125

Tyr Val Phe Val Arg Asp Phe Glu Gln Pro Phe Ile Asn Lys Pro Asp
130 135 140

Thr Leu Leu Val Asn Arg Lys Asp Ala Met Trp Val Pro Cys Leu Val
145 150 155 160

Ser Ile Pro Gly Leu Asn Val Thr Leu Arg Ser Gln Ser Ser Val Leu
165 170 175

Trp Pro Asp Gly Gln Glu Val Val Trp Asp Asp Arg Arg Gly Met Leu
180 185 190

Val Ser Thr Pro Leu Leu His Asp Ala Leu Tyr Leu Gln Cys Glu Thr
195 200 205

Thr Trp Gly Asp Gln Asp Phe Leu Ser Asn Pro Phe Leu Val His Ile
210 215 220

Thr Gly Asn Glu Leu Tyr Asp Ile Gln Leu Leu Pro Arg Lys Ser Leu
225 230 235 240

Glu Leu Leu Val Gly Glu Lys Leu Val Leu Asn Cys Thr Val Trp Ala
245 250 255

Glu Phe Asn Ser Gly Val Thr Phe Asp Trp Asp Tyr Pro Gly Lys Gln
260 265 270

Ala Glu Arg Gly Lys Trp Val Pro Glu Arg Arg Ser Gln Gln Thr His
275 280 285

Thr Glu Leu Ser Ser Ile Leu Thr Ile His Asn Val Ser Gln His Asp
290 295 300

Leu Gly Ser Tyr Val Cys Lys Ala Asn Asn Gly Ile Gln Arg Phe Arg
305 310 315 320

Glu Ser Thr Glu Val Ile Val His Glu Asn Pro Phe Ile Ser Val Glu
325 330 335

Trp Leu Lys Gly Pro Ile Leu Glu Ala Thr Ala Gly Asp Glu Leu Val
340 345 350

Lys Leu Pro Val Lys Leu Ala Ala Tyr Pro Pro Pro Glu Phe Gln Trp
355 360 365

Tyr Lys Asp Gly Lys Ala Leu Ser Gly Arg His Ser Pro His Ala Leu
370 375 380

Val Leu Lys Glu Val Thr Glu Ala Ser Thr Gly Thr Tyr Thr Leu Ala
385 390 395 400

Leu Trp Asn Ser Ala Ala Gly Leu Arg Arg Asn Ile Ser Leu Glu Leu
405 410 415

Val Val Asn Val Pro Pro Gln Ile His Glu Lys Glu Ala Ser Ser Pro
420 425 430

Ser Ile Tyr Ser Arg His Ser Arg Gln Ala Leu Thr Cys Thr Ala Tyr
435 440 445

Gly Val Pro Leu Pro Leu Ser Ile Gln Trp His Trp Arg Pro Trp Thr
450 455 460

Pro Cys Lys Met Phe Ala Gln Arg Ser Leu Arg Arg Arg Gln Gln Gln
465 470 475 480

Asp Leu Met Pro Gln Cys Arg Asp Trp Arg Ala Val Thr Thr Gln Asp
485 490 495

Ala Val Asn Pro Ile Glu Ser Leu Asp Thr Trp Thr Glu Phe Val Glu
500 505 510

Gly Lys Asn Lys Thr Val Ser Lys Leu Val Ile Gln Asn Ala Asn Val
515 520 525

Ser Ala Met Tyr Lys Cys Val Val Ser Asn Lys Val Gly Gln Asp Glu
530 535 540

Arg Leu Ile Tyr Phe Tyr Val Thr Thr Ile Pro Asp Gly Phe Thr Ile
545 550 555 560

Glu Ser Lys Pro Ser Glu Glu Leu Leu Glu Gly Gln Pro Val Leu Leu
565 570 575

Ser Cys Gln Ala Asp Ser Tyr Lys Tyr Glu His Leu Arg Trp Tyr Arg
580 585 590

Leu Asn Leu Ser Thr Leu His Asp Ala His Gly Asn Pro Leu Leu Leu
595 600 605

Asp Cys Lys Asn Val His Leu Phe Ala Thr Pro Leu Ala Ala Ser Leu
610 615 620

Glu Glu Val Ala Pro Gly Ala Arg His Ala Thr Leu Ser Leu Ser Ile
625 630 635 640

Pro Arg Val Ala Pro Glu His Glu Gly His Tyr Val Cys Glu Val Gln
645 650 655

Asp Arg Arg Ser His Asp Lys His Cys His Lys Lys Tyr Leu Ser Val
660 665 670

Gln Ala Leu Glu Ala Pro Arg Leu Thr Gln Asn Leu Thr Asp Leu Leu
675 680 685

Val Asn Val Ser Asp Ser Leu Glu Met Gln Cys Leu Val Ala Gly Ala
690 695 700

His Ala Pro Ser Ile Val Trp Tyr Lys Asp Glu Arg Leu Leu Glu Glu
705 710 715 720

Lys Ser Gly Val Asp Leu Ala Asp Ser Asn Gln Lys Leu Ser Ile Gln
725 730 735

Arg Val Arg Glu Glu Asp Ala Gly Arg Tyr Leu Cys Ser Val Cys Asn
740 745 750

Ala Lys Gly Cys Val Asn Ser Ser Ala Ser Val Ala Val Glu Gly Ser
755 760 765

Glu Asp Lys Gly Ser Met Glu Ile Val Ile Leu Val Gly Thr Gly Val
770 775 780

Ile Ala Val Phe Phe Trp Val Leu Leu Leu Leu Ile Phe Cys Asn Met
785 790 795 800

Arg Arg Pro Ala His Ala Asp Ile Lys Thr Gly Tyr Leu Ser Ile Ile
805 810 815

Met Asp Pro Gly Glu Val Pro Leu Glu Glu Gln Cys Glu Tyr Leu Ser
820 825 830

Tyr Asp Ala Ser Gln Trp Glu Phe Pro Arg Glu Arg Leu His Leu Gly
835 840 845

Arg Val Leu Gly Tyr Gly Ala Phe Gly Lys Val Val Glu Ala Ser Ala
850 855 860

Phe Gly Ile His Lys Gly Ser Ser Cys Asp Thr Val Ala Val Lys Met
865 870 875 880

Leu Lys Glu Gly Ala Thr Ala Ser Glu His Arg Ala Leu Met Ser Glu
885 890 895

Leu Lys Ile Leu Ile His Ile Gly Asn His Leu Asn Val Val Asn Leu
900 905 910

Leu Gly Ala Cys Thr Lys Pro Gln Gly Pro Leu Met Val Ile Val Glu
915 920 925

Phe Cys Lys Tyr Gly Asn Leu Ser Asn Phe Leu Arg Ala Lys Arg Asp
930 935 940

Ala Phe Ser Pro Cys Ala Glu Lys Ser Pro Glu Gln Arg Gly Arg Phe
945 950 955 960

Arg Ala Met Val Glu Leu Ala Arg Leu Asp Arg Arg Arg Pro Gly Ser
965 970 975

Ser Asp Arg Val Leu Phe Ala Arg Phe Ser Lys Thr Glu Gly Gly Ala
980 985 990

Arg Arg Ala Ser Pro Asp Gln Glu Ala Glu Asp Leu Trp Leu Ser Pro
995 1000 1005

Leu Thr Met Glu Asp Leu Val Cys Tyr Ser Phe Gln Val Ala Arg Gly
1010 1015 1020

Met Glu Phe Leu Ala Ser Arg Lys Cys Ile His Arg Asp Leu Ala Ala
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Arg Asn Ile Leu Leu Ser Glu Ser Asp Val Val Lys Ile Cys Asp Phe

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Gly Leu Ala Arg Asp Ile Tyr Lys Asp Pro Asp Tyr Val Arg Lys Gly
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Ser Ala Arg Leu Pro Leu Lys Trp Met Ala Pro Glu Ser Ile Phe Asp
1075 1080 1085

Lys Val Tyr Thr Thr Gln Ser Asp Val Trp Ser Phe Gly Val Leu Leu
1090 1095 1100

Trp Glu Ile Phe Ser Leu Gly Ala Ser Pro Tyr Pro Gly Val Gln Ile
1105 1110 1115 1120

Asn Glu Glu Phe Cys Gln Arg Leu Arg Asp Gly Thr Arg Met Arg Ala
1125 1130 1135

Pro Glu Leu Ala Thr Pro Ala Ile Arg Arg Ile Met Leu Asn Cys Trp
1140 1145 1150

Ser Gly Asp Pro Lys Ala Arg Pro Ala Phe Ser Glu Leu Val Glu Ile
1155 1160 1165

Leu Gly Asp Leu Leu Gln Gly Arg Gly Leu Gln Glu Glu Glu Glu Val
1170 1175 1180

Cys Met Ala Pro Arg Ser Ser Gln Ser Ser Glu Glu Gly Ser Phe Ser
1185 1190 1195 1200

Gln Val Ser Thr Met Ala Leu His Ile Ala Gln Ala Asp Ala Glu Asp
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Ser Pro Pro Ser Leu Gln Arg His Ser Leu Ala Ala Arg Tyr Tyr Asn
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Trp Val Ser Phe Pro Gly Cys Leu Ala Arg Gly Ala Glu Thr Arg Gly
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Ser Ser Arg Met Lys Thr Phe Glu Glu Phe Pro Met Thr Pro Thr Thr
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Tyr Lys Gly Ser Val Asp Asn Gln Thr Asp Ser Gly Met Val Leu Ala
1265 1270 1275 1280

Ser Glu Glu Phe Glu Gln Ile Glu Ser Arg His Arg Gln Glu Ser Gly
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Phe Arg

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<400> 33

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aagttgggta acgccagg 18

<210> 36
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tgacctcgcc cccgt 15

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cttgattgat gacttattgc aaatggcggt tggctgagga aaacccatga cacagcacaa 2880

ctctacagac agtgatgtgt ctcttgtttc tactgctaag aaggtctgaa aatttaatga 2940

aaccacttca tacatttaag tattttgttt ggtttgaact caatcagtag cttttcctta 3000

catgtttaaa aataattcca atgacagatg agcagctcac ttttccaaag taccccaaaa 3060

ggccaaatta aaaaaaaaaa aaaaaaaa 3088

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<212> PRT
<213> Homo sapiens

<400> 38

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Phe Phe Ala Lys Ala Arg Ala Thr Phe Phe Ser Ala Met Asn Pro Gln
35 40 45

Gly Ser Glu Gln Asp Val Glu Tyr Ser Val Val Gln His Ala Asp Gly
50 55 60

Glu Lys Ser Asn Val Leu Arg Lys Leu Leu Lys Arg Ala Asn Ser Tyr
65 70 75 80

Glu Asp Ala Met Met Pro Phe Pro Gly Ala Thr Ile Ile Ser Gln Leu
85 90 95

Leu Lys Asn Asn Met Asn Lys Asn Gly Gly Thr Glu Pro Ser Phe Gln
100 105 110

Ala Ser Gly Leu Ser Ser Thr Gly Ser Glu Val His Gln Glu Asp Ile
115 120 125

Cys Ser Asn Ser Ser Arg Asp Ser Pro Pro Glu Cys Leu Ser Pro Phe
130 135 140

Gly Arg Pro Thr Met Ser Gln Phe Asp Met Asp Arg Leu Cys Asp Glu
145 150 155 160

His Leu Arg Ala Lys Arg Ala Arg Val Glu Asn Ile Ile Arg Gly Met
165 170 175

Ser His Ser Pro Ser Val Ala Leu Arg Gly Asn Glu Asn Glu Arg Glu
180 185 190

Met Ala Pro Gln Ser Val Ser Pro Arg Glu Ser Tyr Arg Glu Asn Lys
195 200 205

Arg Lys Gln Lys Leu Pro Gln Gln Gln Gln Gln Ser Phe Gln Gln Leu
210 215 220

Val Ser Ala Arg Lys Glu Gln Lys Arg Glu Glu Arg Arg Gln Leu Lys
225 230 235 240

Gln Gln Leu Glu Asp Met Gln Lys Gln Leu Arg Gln Leu Gln Glu Lys
245 250 255

Phe Tyr Gln Ile Tyr Asp Ser Thr Asp Ser Glu Asn Asp Glu Asp Gly
260 265 270

Asn Leu Ser Glu Asp Ser Met Arg Ser Glu Ile Leu Asp Ala Arg Ala
275 280 285

Gln Asp Ser Val Gly Arg Ser Asp Asn Glu Met Cys Glu Leu Asp Pro
290 295 300

Gly Gln Phe Ile Asp Arg Ala Arg Ala Leu Ile Arg Glu Gln Glu Met
305 310 315 320

Ala Glu Asn Lys Pro Lys Arg Glu Gly Asn Asn Lys Glu Arg Asp His
325 330 335

Gly Pro Asn Ser Leu Gln Pro Glu Gly Lys His Leu Ala Glu Thr Leu
340 345 350

Lys Gln Glu Leu Asn Thr Ala Met Ser Gln Val Val Asp Thr Val Val
355 360 365

Lys Val Phe Ser Ala Lys Pro Ser Arg Gln Val Pro Gln Val Phe Pro
370 375 380

Pro Leu Gln Ile Pro Gln Ala Arg Phe Ala Val Asn Gly Glu Asn His
385 390 395 400

Asn Phe His Thr Ala Asn Gln Arg Leu Gln Cys Phe Gly Asp Val Ile
405 410 415

Ile Pro Asn Pro Leu Asp Thr Phe Gly Asn Val Gln Met Ala Ser Ser
420 425 430

Thr Asp Gln Thr Glu Ala Leu Pro Leu Val Val Arg Lys Asn Ser Ser
435 440 445

Asp Gln Ser Ala Ser Gly Pro Ala Ala Gly Gly His His Gln Pro Leu
450 455 460

His Gln Ser Pro Leu Ser Ala Thr Thr Gly Phe Thr Thr Ser Thr Phe
465 470 475 480

Arg His Pro Phe Pro Leu Pro Leu Met Ala Tyr Pro Phe Gln Ser Pro
485 490 495

Leu Gly Ala Pro Ser Gly Ser Phe Ser Gly Lys Asp Arg Ala Ser Pro
500 505 510

Glu Ser Leu Asp Leu Thr Arg Asp Thr Thr Ser Leu Arg Thr Lys Met
515 520 525

Ser Ser His His Leu Ser His His Pro Cys Ser Pro Ala His Pro Pro
530 535 540

Ser Thr Ala Glu Gly Leu Ser Leu Ser Leu Ile Lys Ser Glu Cys Gly
545 550 555 560

Asp Leu Gln Asp Met Ser Glu Ile Ser Pro Tyr Ser Gly Ser Ala Met
565 570 575

Gln Glu Gly Leu Ser Pro Asn His Leu Lys Lys Ala Lys Leu Met Phe
580 585 590

Phe Tyr Thr Arg Tyr Pro Ser Ser Asn Met Leu Lys Thr Tyr Phe Ser
595 600 605

Asp Val Lys Phe Asn Arg Cys Ile Thr Ser Gln Leu Ile Lys Trp Phe
610 615 620

Ser Asn Phe Arg Glu Phe Tyr Tyr Ile Gln Met Glu Lys Tyr Ala Arg
625 630 635 640

Gln Ala Ile Asn Asp Gly Val Thr Ser Thr Glu Glu Leu Ser Ile Thr
645 650 655

Arg Asp Cys Glu Leu Tyr Arg Ala Leu Asn Met His Tyr Asn Lys Ala
660 665 670

Asn Asp Phe Glu Val Pro Glu Arg Phe Leu Glu Val Ala Gln Ile Thr
675 680 685

Leu Arg Glu Phe Phe Asn Ala Ile Ile Ala Gly Lys Asp Val Asp Pro
690 695 700

Ser Trp Lys Lys Ala Ile Tyr Lys Val Ile Cys Lys Leu Asp Ser Glu
705 710 715 720

Val Pro Glu Ile Phe Lys Ser Pro Asn Cys Leu Gln Glu Leu Leu His
725 730 735

Glu